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WAR DEPARTMENT

TECHNICAL MANUAL

**ORDNANCE MAINTENANCE:
FIRE EXTINGUISHERS**

APRIL 23, 1943

FOR ORDNANCE PERSONNEL ONLY

TECHNICAL MANUAL }
No. 9-1799 }

WAR DEPARTMENT
Washington, April 23, 1943

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

Prepared under the direction of the
Chief of Ordnance

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ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

Section I

INTRODUCTION

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1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of fire extinguishers.

b. This manual contains illustrations and description of, procedure for the operation, maintenance, charging, disassembly, inspection and repair, and assembly of the following fire extinguishers:

C-O-TWO FIRE EXTINGUISHERS

Ordinance No.	Style	Size	Type	Manufacturer's No.
B183325	Fixed	10-lb	CO ₂ (Carbon dioxide)	AP-4
D37127	Portable	4-lb	CO ₂ (Carbon dioxide)	Type PS-4

KIDDE-LUX FIRE EXTINGUISHERS

B183325	Fixed	10-lb	CO ₂ (Carbon dioxide)	79120
D38702	Fixed	7½-lb	CO ₂ (Carbon dioxide)	23860
D37127	Portable	4-lb	CO ₂ (Carbon dioxide)	79143

FIRE GUARD FIRE EXTINGUISHER

A229521	Portable	1-qt	CCl ₄ (Carbon tetrachloride)	Model 85 HD
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O-FIRE-GUN FIRE EXTINGUISHER

C74060	Portable	1-qt	CCl ₄ (Carbon tetrachloride)	13 x 1193
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INTRODUCTION

2. CHARACTERISTICS.

a. **General.** These fire extinguishers are of two types, those which use carbon dioxide as an agent for fighting fire and those which use CARBON TETRACHLORIDE.

b. **Carbon Dioxide Fire Extinguishers.** The carbon dioxide fire extinguishers are of the 4-pound, 7½-pound, and 10-pound size manufactured by C-O-Two Fire Equipment Company and Walter Kidde Company. These weights are the weight of carbon dioxide in the cylinder when fully charged. The 7½-pound and 10-pound extinguishers are equipped with the same type valve and can be connected to a fixed fire extinguisher system or a discharge hose and horn, and used as a portable job. The 4-pound extinguisher is a portable job only. The carbon dioxide extinguishers are used in class B and C fires.

c. **Carbon Tetrachloride Fire Extinguishers.** The carbon tetrachloride fire extinguishers are the Fire Guard and the O-Fire-Gun. These are of the 1-quart vaporizing liquid type for hand pumping operation and are used for Class B and C fires. The following is a list of fire classifications:

(1) **CLASS A FIRES.** Fires in ordinary combustible material where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water are of first importance.

(2) **CLASS B FIRES.** Fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) **CLASS C FIRES.** Fires in electrical equipment where the use of a nonconducting extinguishing agent is of first importance.

3. ALLOCATION OF MAINTENANCE DUTIES BY ECHELONS.

a. Echelons and words as used in this list of maintenance allocation are defined as follows:

SECOND ECHELON: Line organization regiments, battalions, companies (first and second echelons).

THIRD ECHELON: Ordnance light maintenance companies, ordnance medium maintenance companies, ordnance divisional maintenance battalions, and post ordnance shops.

FOURTH ECHELON: Ordnance heavy maintenance companies, and service command shops.

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

- FIFTH ECHELON:** Ordnance base regiments, ordnance bases, arsenals, and manufacturers' plants.
- SERVICE:** (Including preventive maintenance) (par. 23 a (1) and (2), AR 850-15 (10-6-42)) Consists of servicing, cleaning, lubricating, tightening bolts and nuts, and making external adjustments of subassemblies or assemblies and control.
- REPLACE:** (par. 23 a (4) AR 850-15 (10-6-42)) Consists of removing the part, subassembly or assembly from the vehicles and replacing it with a new or reconditioned or rebuilt part, subassembly or assembly, whichever the case may be.
- REPAIR:** (par. 23 a (3) and (5), in part, AR 850-15 (10-6-42)) Consists of making repairs to, or replacement of the part, subassembly or assembly that can be accomplished without completely disassembling the subassembly or assemblies, and does not require heavy welding, or riveting, machining, fitting and/or balancing.
- REBUILD:** (par. 23 a (5), in part, and (6), AR 850-15 (10-6-42)) Consists of completely reconditioning and replacing in serviceable condition any unserviceable part, subassembly, or assembly of the vehicle, including welding, riveting, machining, fitting, alining, balancing, assembling, and testing.

b. Maintenance Allocations.

NOTE: Operations allocated will normally be performed in the echelon indicated by "X". Operations allocated to the echelons as indicated by "E" may be accomplished by the respective echelons in emergencies only.

FIRE EXTINGUISHING SYSTEMS	ECHELONS			
	2nd	3rd	4th	5th
Controls, remote — replace	X			
Controls, remote — repair		X		
Cylinder, CO ₂ — replace	X			
Cylinder, CO ₂ — repair and recharge		X		
Extinguisher assemblies, fire, CO ₂ — repair and recharge....		X		
Extinguisher assemblies, fire, CO ₂ — rebuild			E	X
Extinguisher assemblies, fire, CCl ₄ — replace and refill.....	X			
Extinguisher assemblies, fire, CCl ₄ — repair		X		
Lines and nozzles — replace	X			
Lines and nozzles — repair		X		

Section II

C-O-TWO FIRE EXTINGUISHERS (CO₂)

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Control head, 10-pound unit	11
PS-4 squeeze grip valve, 4-pound unit	12
Siphon tube	13

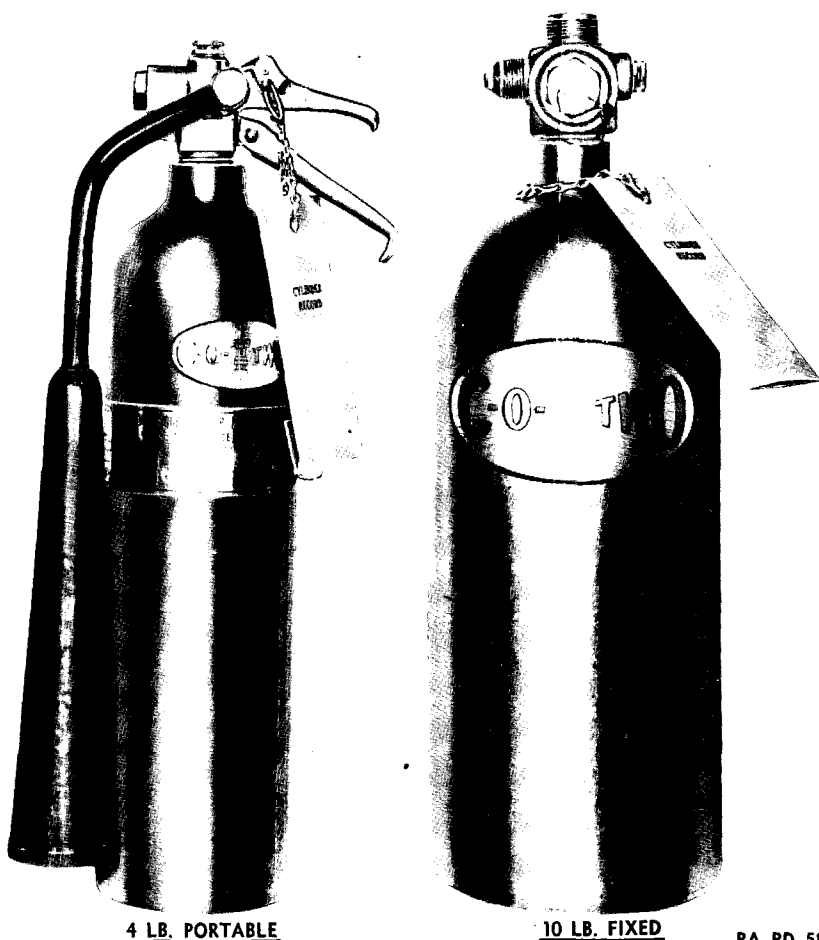
4. DESCRIPTION.

a. These fire extinguishers, as manufactured by the C-O-Two Fire Extinguisher Company, are as follows:

Ordinance No.	Type	Size	Manufacturer's Identification
D37127	Portable	4-lb	Type PS-4
B183325	Fixed	10-lb	Type AP-4

b. **Portable Unit, 4-Pound** (fig. 1). This extinguisher is a portable unit charged with 4 pounds (by weight) of carbon dioxide and equipped with a handle for carrying it to the scene of the fire. The cylinder is made of high quality steel, tested to withstand a hydrostatic pressure of 3,360 pounds, and has a flat bottom to permit the cylinder to stand in an upright position. Part of later production is manufactured with round bottoms. It is equipped with a squeeze grip valve which retains the gas and controls the discharge when the trigger is squeezed. It has a discharge horn fastened to the valve for directing the discharge on the fire.

c. **Fixed Unit, 10-Pound** (fig. 1). This extinguisher is a fixed unit connected to a distributing system and is charged with 10 pounds (by weight) of carbon dioxide. The cylinder is made of high quality steel to withstand a hydrostatic pressure of 3,360 pounds. This cylinder is equipped with the AP-4 valve (fig. 9) securely screwed into the cylinder, and is provided with a siphon tube having a universal coupling and extending to the bottom of the cylinder. This permits the cylinder to be in-

**ORDNANCE MAINTENANCE:
FIRE EXTINGUISHERS****4 LB. PORTABLE****10 LB. FIXED**

RA PD 58292

Figure 1 — C-O-Two Fire Extinguishers

stalled in either a vertical or horizontal position. The cylinder valve consists essentially of a primary check and a secondary check. The checks retain the gas in the cylinder, both being subjected directly to the gas pressure in the cylinder. Thus, they are always firmly pressure-seated whenever gas is in the cylinder and before the primary check is tripped. The primary check, at the top of the valve, is opened by means of a pin actuated by a cam in the control head (control head is part of vehicle equipment and is not removed when extinguishers are changed). The gas discharged through the primary check is admitted through a drilled passage to the space above the piston of the secondary check. The pressure on this piston opens the secondary check, allowing the gas to discharge through the valve

C-O-TWO FIRE EXTINGUISHERS (CO₂)

outlet. Once the primary check is opened by the control head pin the entire content of the cylinder will be discharged.

d. **Control Head** (fig. 10). The control head is not a part of the extinguisher, but is a part of the distributing and control system used with the cylinders equipped with an AP-4 valve. The head is mounted on the valve by means of a swivel nut. The pin for operating the primary check in the cylinder valve, is actuated by the cam in the center of the control head. The cam may be rotated by either the manual release lever or by the cable sheave, each operating independently of the other.

5. OPERATION.

a. **Portable Unit, 4-Pound** (fig. 2). Remove extinguisher from hanger bracket. Carry extinguisher to scene of fire by the carrying handle. Pull locking pin from trigger, breaking sealing wire. Cylinder must remain in an upright position. Squeeze trigger and handle together and direct the discharge by raising or lowering the discharge horn. Direct the discharge at the base of the flame and work upward. When fighting floor fires, extinguish the portion nearest you first; then advance the discharge as the flame is extinguished. Do not haphazardly direct discharge over various sections of the fire. Put out one portion of the fire completely before attacking other parts. Continue the discharge after the flames are out, so as to coat the hot material with carbon dioxide snow. The time required for the discharge of C-O-Two portable cylinders is as follows:

Size	Time in Seconds
2-lb	13
4-lb	18
7 ½-lb	15
10-lb	28
10-lb (equipped with Kidde-Lux or AP-4 Valve)	3
15-lb	24
20-lb	25

NOTE: Replace used extinguisher with a fully charged one at once. Have used extinguisher shipped to charging station.

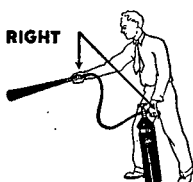
b. **Fixed Unit, 10-Pound.** The fixed unit is connected to the fire extinguishing system through a control head and tubing. To operate pull release handle marked "FIRE PULL," located either on the inside or outside of vehicle, or in both places. The cylinder may also be discharged by removing the locking pin in the control head and rotating the small lever marked "PULL" on one side and "PUSH" on the other. The locking pin need not be removed in order to release the gas with the cable pull. Once

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

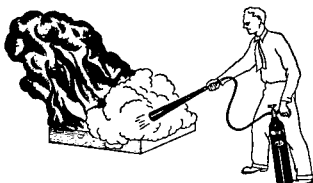
The RIGHT Way

- 1** Carry extinguisher to fire **THEN OPEN VALVE.**

- 2** **CARRY** extinguisher with left hand. Hold nozzle at **HOSE END** of **HANDLE** with other hand.



- 3** Direct discharge **CLOSE** to fire.



- 4** Direct discharge **FIRST** at **EDGE** **NEAREST OPERATOR** or, if on vertical surface, at **BOTTOM** OF **FIRE**.



- 5** **SLOWLY AND DELIBERATELY ADVANCE** discharge as flame is extinguished. Be sure all flame is **OUT** in part of fire tackled before advancing.

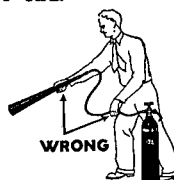
- 6** Continue discharge after flames are out so as to **COAT HOT MATERIAL WITH CARBON DIOXIDE SNOW.**

- 7** Have extinguisher **RECHARGED AS SOON AS POSSIBLE.**

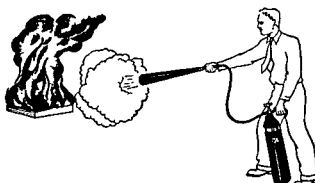
The WRONG Way

- 1** **DON'T OPEN VALVE BEFORE** carrying extinguisher to fire.

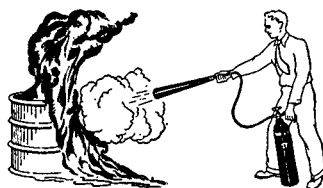
- 2** **DON'T** stand extinguisher on the ground. **DON'T** hold nozzle near discharge end.



- 3** **DON'T** direct discharge at fire **FROM FAR AWAY.**



- 4** **DON'T** direct discharge at center of fire and then attempt to work to the edge.



- 5** **DON'T HAPHAZARDLY** direct discharge over various sections of fire. Put out one portion of fire completely before attacking other parts.

- 6** **DON'T** shut off extinguisher **AS SOON AS** flame is put out.

- 7** **DON'T** put used extinguisher aside and **FORGET** about recharging.

RA PD 7062

Figure 2 — Correct Use Of Carbon Dioxide Fire Extinguisher

C-O-TWO FIRE EXTINGUISHERS (CO₂)

the cable is pulled or the lever rotated, the entire content of the cylinder will be discharged.

6. EFFECT OF CARBON DIOXIDE ON PERSONNEL.

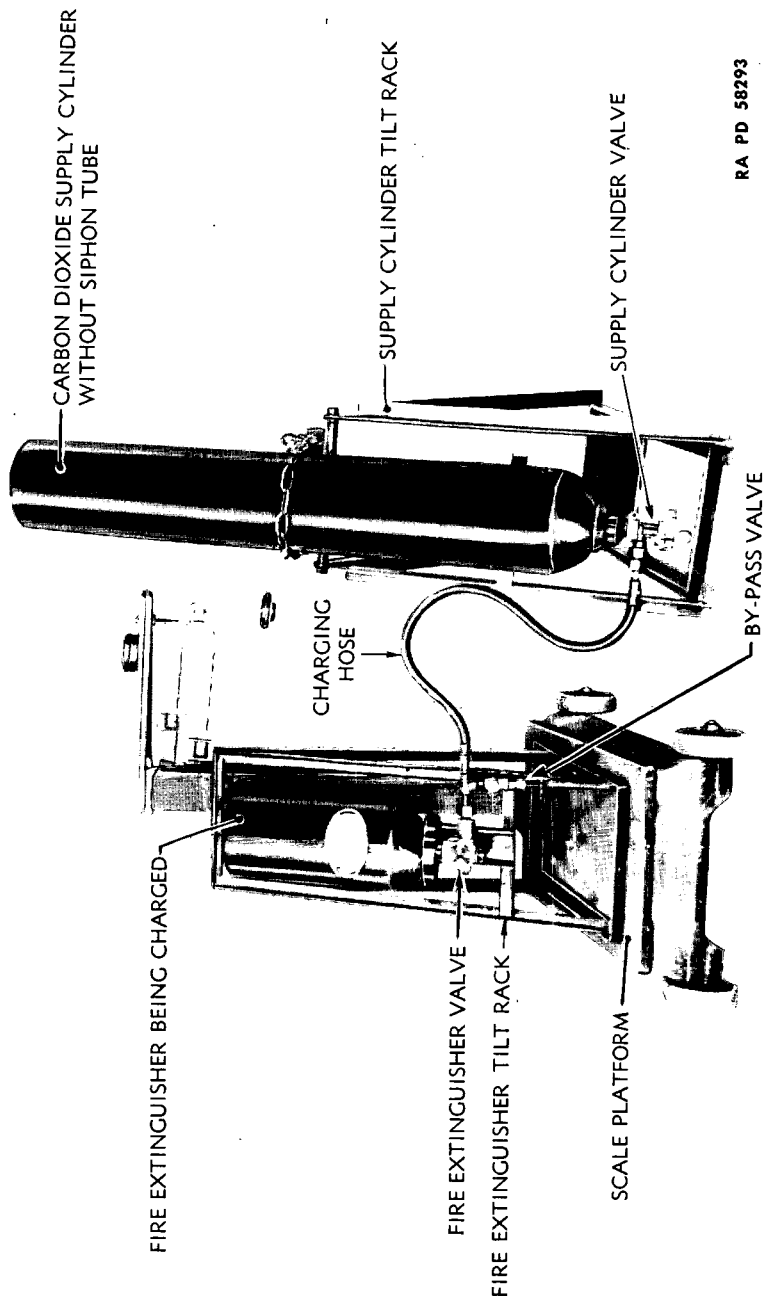
a. These fire extinguishers use carbon dioxide as an agent for fighting fires. Carbon dioxide (not to be confused with carbon monoxide) is not poisonous, but suffocating. It is normally colorless except that when discharging it resembles a cloud of steam. When inhaled it produces a tingle in the nostrils, the same as experienced when drinking soda water. It can be applied to the skin in the form of snow with no ill effect. If applied with a slight pressure to the skin in the form of dry ice, it will produce a painful blister. It is a nonconductor of electricity, it is noncorrosive and non-injurious to all substances, and although heavier than air, it can be easily diffused and removed by ventilation. Unlike air, it does not contain oxygen in any form available to support combustion or for sustaining human life in breathing. Since a person cannot breath but will suffocate in an atmosphere of carbon dioxide, caution must be taken before entering any space filled with this gas. Thoroughly ventilate the space into which the gas has been discharged to make certain that all portions contain fresh air. Should it be necessary for a person to enter a space before it is thoroughly ventilated, he may do so for a short period by holding his breath. Should a person be overcome by carbon dioxide, it is essential that he be rescued from the space containing the gas within 5 minutes. To revive a person so overcome, give him plenty of fresh air and apply artificial respiration, as in the case of drowning in water.

7. MAINTENANCE (PREVENTIVE).

a. Every 4 months the control head must be removed from the cylinder. Weigh the cylinder to determine the weight of carbon dioxide. Contents can be determined only by weight, do not use a pressure gage. The empty weight and full weight is stamped on the valve of each cylinder as it stands, without the control head, and other attachments, or the discharge horn on the portable cylinder. Weigh the cylinder with content. From this weight subtract the empty weight stamped on the valve. The net weight must be within 10 percent of the full weight (9 pounds for the 10-pound unit, 3.6 pounds for the 4-pound unit). Cylinders which do not meet these weights must be removed for recharging and a full cylinder installed. The portable extinguisher must be weighed in the same manner, and replaced if not up to weight.

b. While the control head is disconnected from the cylinder valve, test operation of the pull cable, and the pull lever on the control head, to make

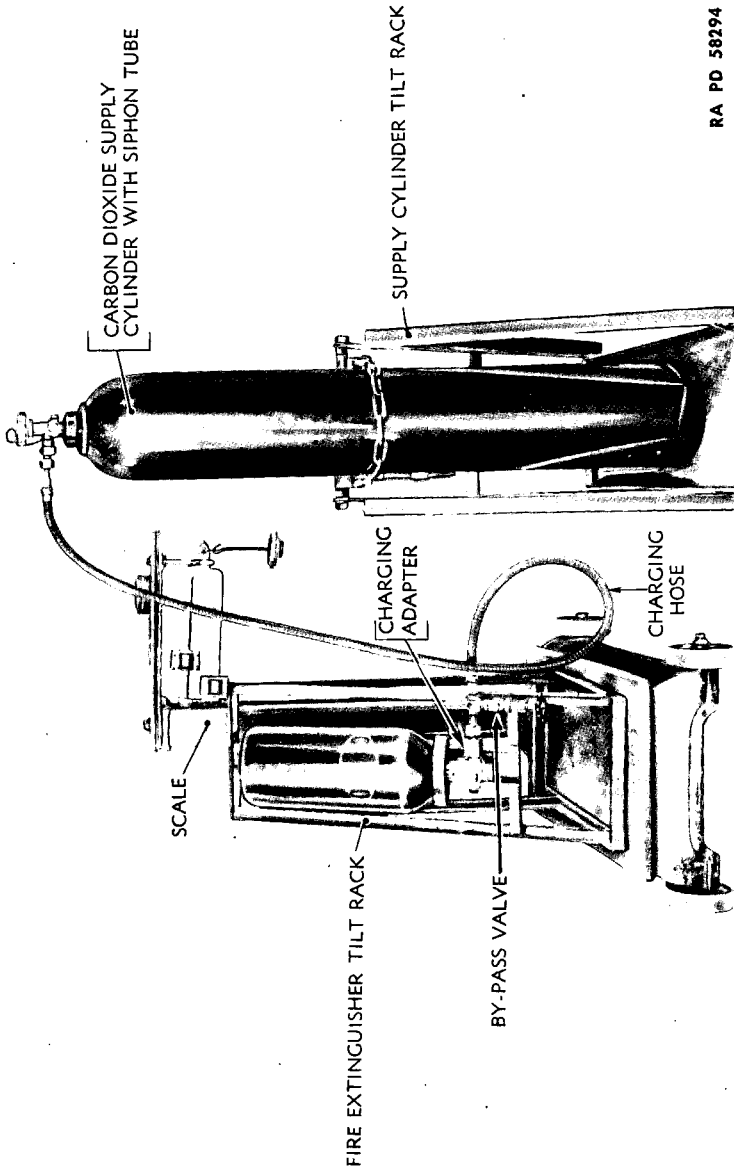
ORDNANCE MAINTENANCE:
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RA PD 58293

Figure 3 — Charging CO₂ Fire Extinguisher By The Cooling Method
Using A Supply Cylinder Without A Siphon Tube

C-O-TWO FIRE EXTINGUISHERS (CO₂)



RA PD 58294

**Figure 4 — Charging CO₂ Fire Extinguisher By The Cooling Method
Using A Supply Cylinder Equipped With A Siphon Tube**

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

sure the cam and plunger pin work freely. Connect control head to valve and install locking pin and seal wire.

c. After long rough trips or after combat, examine the cylinders in general for bad dents or breaks. Check condition of valve, control heads, clamps and, on the portable unit, the discharge horn. On fixed units the cylinder connections, tubing, nozzles and horns must be checked. Tighten all connections and replace any broken or damaged parts.

8. RECHARGING CYLINDERS.

a. General.

(1) These instructions are for the charging of cylinders by the cooling method (figs. 3 and 4). This method consists of first introducing a small charge of carbon dioxide into the extinguisher to be charged, then allowing this carbon dioxide to discharge into the atmosphere, thus cooling the cylinder. After this precooling, the full charge may be introduced by simple flow due to the equalization of pressure and temperature.

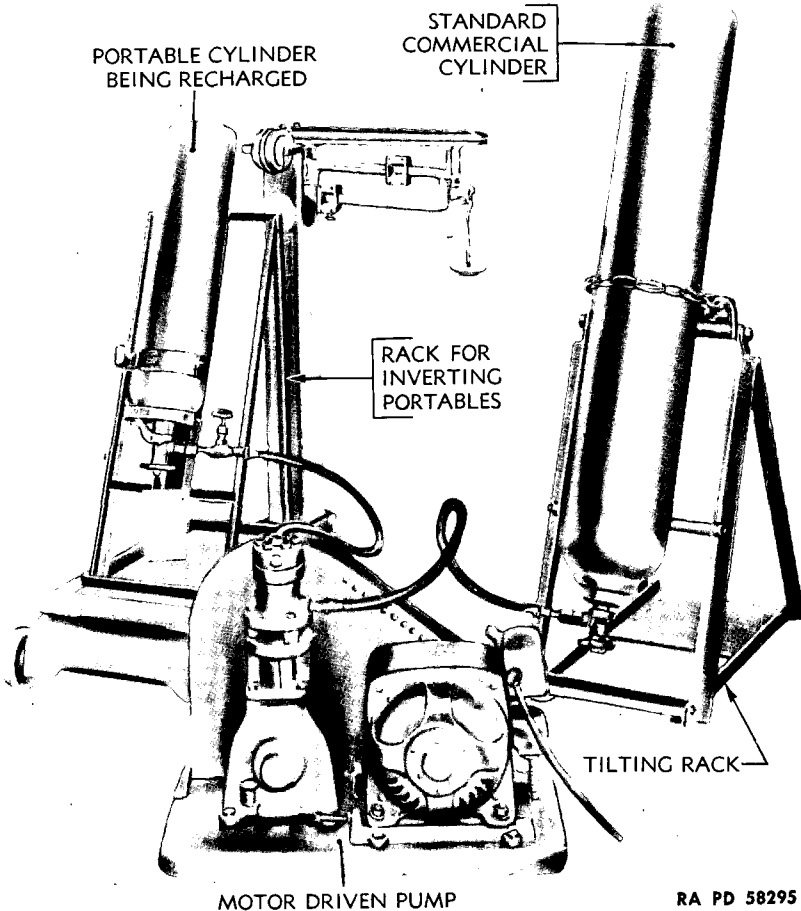
(2) The cooling method permits charging to be done with a minimum of parts and at a small initial expense. It is recommended that this method be used only on extinguishers of 20-pound capacity or smaller.

(3) In charging extinguishers of larger capacity than 20 pounds, or small extinguishers in large quantities, it is advisable to use a *transfer unit* (fig. 5). The speed and economy in the use of this unit will offset the initial outlay.

(4) Before charging any cylinder, check the date of last hydrostatic test. This date is stamped on the cylinder just below the neck. The month and year only, are shown; for example, 8-41 would mean August 1941. If 5 years have elapsed since the last test, the cylinder must be set aside for shipment to the nearest testing station. The hydrostatic test pressure on carbon dioxide cylinder is 3,360 pounds per square inch.

b. Procedure, Cylinders With AP-4 And PS-4 Valves.

(1) **EQUIPMENT.** Obtain a commercial cylinder of 50 pounds or greater capacity to be used as a supply. Carbon dioxide must be bone dry and the valve must have the largest outlet port available. Procure a platform scale that is accurate to within 2 ounces, a tilt rack to mount on the scale, a tilt rack for the supply cylinder, a bypass valve, and a charging hose with adapters (figs. 3 and 6). Due to high pressure of charging gas, only hose made for this purpose must be used. If the supply cylinder is equipped with a siphon tube the tilt rack is not necessary. However, the

C-O-TWO FIRE EXTINGUISHERS (CO₂)

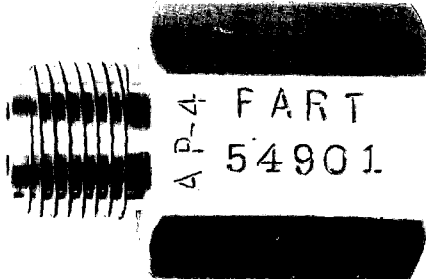
RA PD 58295

Figure 5 — Charging CO₂ Fire Extinguisher With A Transfer Unit

cylinder must be set upright and securely fastened to prevent falling over. If the scale tilt rack cannot be obtained, the extinguisher can be laid on the scale, and a 4-inch square block placed under the bottom end.

(2) **WEIGH CYLINDER TO DETERMINE HOW MUCH CARBON DIOXIDE IS IN THE CYLINDER.** Empty weight stamped on the valve of the portable extinguisher does not include the discharge horn. Empty weight stamped on the valve of the fixed extinguisher does not include the control head. These parts must be removed when weighing to determine how much carbon dioxide is in the cylinder. Subtract the empty weight from the scale reading and mark the remainder (the net weight of gas in the cylinder) in chalk on the cylinder. **NOTE:** If extinguisher is completely empty, make sure that the safety disk is intact. To replace blown safety disk, unscrew

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RA PD 58321

**Figure 6 — Adapters Used To Connect C-O-Two
Fire Extinguishers For Charging**

safety nut on side of valve body and replace with a new safety disk and washer, installing the washer first. Tighten securely. Safety disk and washers are in the record card envelope attached to each cylinder.

(3) **CONNECT EQUIPMENT.** Place tilt rack on scale. Mount cylinder to be charged, to the tilt rack (fig. 4). Connect the adapter (fig. 6) to the discharge outlet of cylinder and connect a bypass valve to the adapter. It is not necessary to remove the recoil preventer. Connect charging hose to adapter. Mount supply cylinder in tilt rack and connect charging hose to valve.

(4) **COMPUTE SCALE SETTING.** Set scale to point of balance and read weight. This reading will include weight of tilt rack, weight of overhanging charging hose, empty weight of extinguisher, and weight of remaining carbon dioxide in the cylinder. From this scale reading, subtract the computed weight of carbon dioxide remaining in the cylinder, as computed, and mark in chalk on cylinder (subparagraph b (2) above); add to this result the capacity of the extinguisher. Set the scale for this final weight.

Example:

62 lb = weight of tilt rack, overhanging hose, empty cylinder, and remaining carbon dioxide

-2 lb = weight of remaining carbon dioxide, as computed and chalked on cylinder

60 lb = total weight less weight of remaining carbon dioxide

+4 lb = weight of carbon dioxide in a 4-pound extinguisher when full

64 lb = scale setting to fill a 4-pound extinguisher

NOTE: The figures used in the above example are fictitious and do not represent a specific case.

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(5) FILL CYLINDER.**

(a) The cylinder to be charged is now in its proper position and the scale set for full weight. Close the bypass valve. Open the valve on the supply cylinder; the carbon dioxide pressure will automatically open the valve on the cylinder being charged, allowing the carbon dioxide to flow into the empty cylinder. Squeeze trigger, place locking pin between top end of trigger and body of the valve. This will hold the check open, allowing the gas to flow more freely. Watch the scale for the point of balance or until the scale shows no further increase. During warm weather, cooling the cylinders in cold running water will assist in making the initial charge. Be sure the valve is free of all water before charging.

(b) If cylinder has been charged to its full weight, proceed with step (e) below.

(c) If the cylinder has not attained its full weight, close the valve on the supply cylinder and open the bypass valve. Squeeze the trigger handle to discharge some of the carbon dioxide from the cylinder being charged. This will cool the cylinder and possibly coat it with frost. If a fixed unit is being charged, discharge by pressing the primary check stem with a screwdriver until the cooling takes place. Roll cylinder, which now contains liquid carbon dioxide (CO₂), to chill the cylinder uniformly.

(d) Close bypass valve and open supply cylinder until the cylinder being charged contains its full rated weight of carbon dioxide. If flow is not sufficient to give this weight, repeat step (c) for further cooling.

(e) Close supply cylinder valve tight, open bypass valve and remove charging hose, bypass valve, and adapter from the fully charged cylinder. Remove extinguisher from tilt rack.

(6) TEST RECHARGED EXTINGUISHER VALVES FOR LEAKS. During test no hose or other equipment must be attached to the valve. The small hole in the control head connection, which leads to the drilled passage must be plugged to keep water from entering. Water in this passage or in the piston section, would freeze in cold weather and keep the valve from operating, making the fire extinguisher useless. Do not use wood for a plug as it may break off and plug the hole. The factory uses a tapered plastic plug about one and one half inches long. Test the cylinder for leakage by filling control head outlet with water; also place gas outlet under water. **CAUTION:** Do not submerge entire valve. If any bubbles are detected, they may be the result of the escape of trapped air, not leakage of the valve. If any bubbles appear on retest, valve leakage may be due to foreign matter on primary check or secondary check. Determine if bubbles issue from primary check or secondary check. If leak is from control head connection, trip the primary check with a screwdriver. The escaping gas

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may clean the seat and the primary check may then return to a good seat. If leak is from the discharge outlet the secondary check is leaking. In either case, the valve will have to be disassembled, inspected, and assembled (pars. 10, 11 and 12). Remove all water and fill in recharging data on the record card that is attached to each extinguisher. Place thread protector over control head connection of the fixed units and install locking pin and seal wire on the portable unit. Interstate Commerce Commission Regulations require charged carbon dioxide cylinders to be labeled with the green tab.

9. STORAGE AND SHIPMENT.

a. Storage.

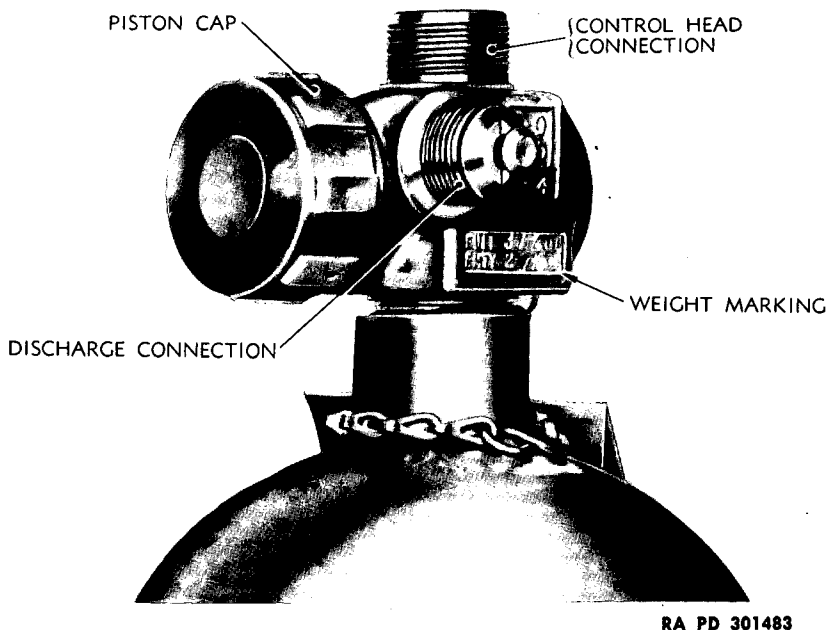
(1) Charged extinguishers shall preferably be stored in a cool, dry place. They may be stored in the open, but under such conditions shall be protected from the extremes of weather. In winter they must be protected against accumulations of snow and ice, and in the summer from the direct rays of the sun.

(2) Charged cylinders must not be left near furnace, heater, radiator, or any source of heat, as any increase in temperature will cause a corresponding increase in the pressure within the cylinder and may reach dangerous proportions. The following table shows the cylinder pressures at various temperatures using an ordinary pressure gage.

Temperature CO ₂ Pressure	Per Square In.	Temperature CO ₂ Pressure	Per Square In.
-10 F	245 lb	80 F	960 lb
0 F	285 lb	90 F	1,190 lb
10 F	345 lb	100 F	1,450 lb
20 F	400 lb	110 F	1,710 lb
32 F	489 lb	120 F	1,980 lb
40 F	550 lb	130 F	2,250 lb
50 F	635 lb	140 F	2,530 lb
60 F	729 lb	150 F	2,810 lb
70 F	834 lb	160 F	3,090 lb

(3) Charged cylinders must never be stored near gangways, elevators, or where they are in danger of being struck by passing objects.

(4) If a large number of cylinders is to be stored, the building must be well ventilated to prevent a possible concentration of carbon dioxide being built up from leaky valves. Extinguishers in storage should be weighed at least once every 6 months. This is a check on leaky valves or ruptured safety disk. If an extinguisher is found with a broken seal it should be

C-O-TWO FIRE EXTINGUISHERS (CO₂)

RA PD 301483

Figure 7 — AP-4 Valve (C-O-Two Fire Extinguisher)

weighed at once. If found full it must be resealed. If not full, it must be removed for charging.

b. Shipping.

(1) All extinguishers must be weighed at the time of shipping, to offset possibility of shipping partly empty units. They must be labeled with a green tag as prescribed in Regulations of Interstate Commerce Commission.

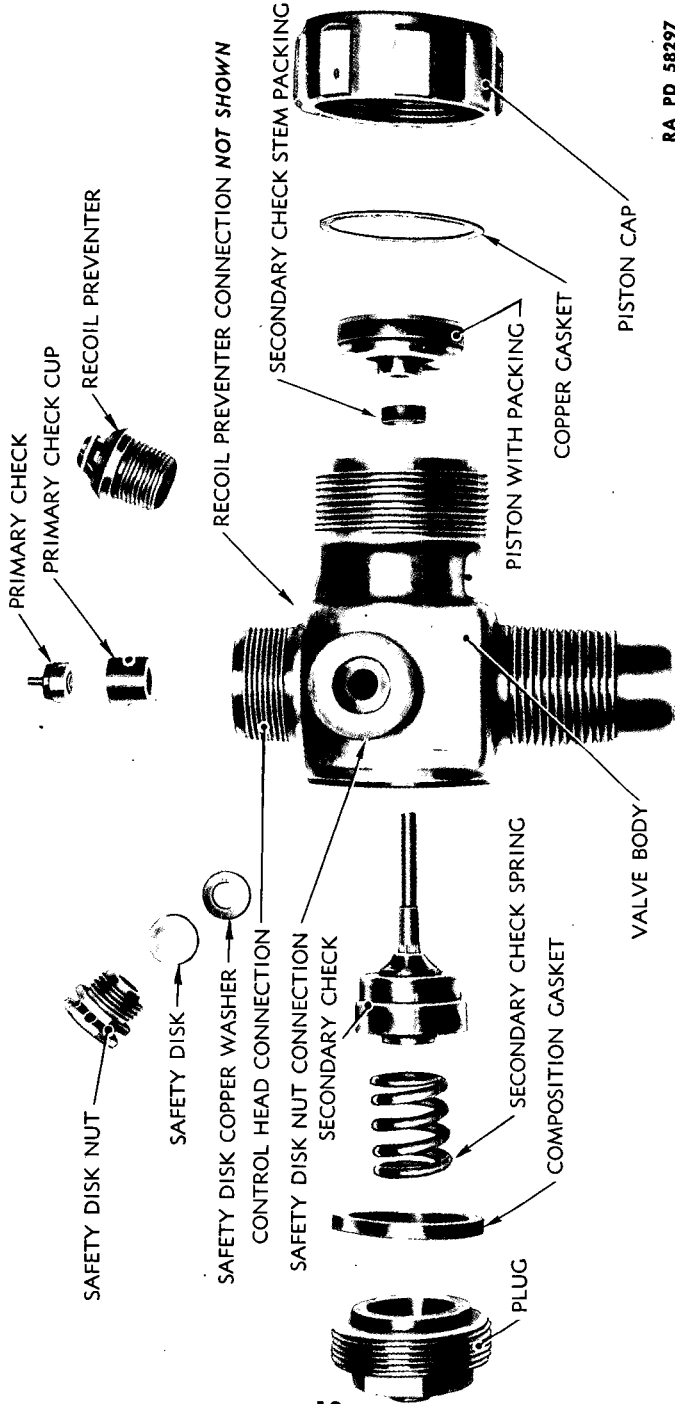
(2) When shipping carbon dioxide extinguishers they must be packed in such a manner that they will not be knocked over or the valves damaged.

(3) Extinguishers must not be handled by a crane except when handled on a suitably constructed cradle or container. They must never be handled by a magnet, rope, or cable sling. They must not be dropped, permitted to strike each other, or be handled roughly. **CAUTION:** Any cylinder containing gas under pressure is dangerous and must be handled carefully. It is as potentially dangerous as a loaded shell.

10. AP-4 VALVE, 10-POUND UNIT (fig. 7).

a. Description. The AP-4 valve is mounted on the 10-pound fixed fire extinguisher and operates in conjunction with a control head. This

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FIRE EXTINGUISHERS



RA PD 58297

Figure 8 — AP-4 Valve — Disassembled (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)

valve has a forged brass body which contains a primary check, secondary check, and an operating piston. The valve is equipped with a safety disk which will rupture and empty the cylinder if cylinder pressure exceeds 2,600 to 2,900 pounds. The valve outlet is equipped with a recoil preventer to prevent the cylinder from rocketing in case the valve is accidentally opened when the valve outlet is not connected. The primary check is opened by the control head pin, which permits the gas pressure of the cylinder to pass through a drilled passage to the head of the piston. The piston is then forced against and moves the secondary check stem, opening the secondary check. The entire content of the cylinder is then discharged. The servicing of this valve is taken care of without removing the valve from the cylinder.

b. Disassembly (figs. 8 and 9).**(1) EQUIPMENT.****HAMMER****PLIERS****PUNCH, pin****ROD, brass, 1/8- x 6-in.****WRENCH, box, 1 1/8-in.****WRENCH, box, 1 1/4-in.****WRENCH, cap, special****WRENCH, recoil preventer,
special****(2) PROCEDURE.**

(a) Before starting any disassembly the cylinder must be completely empty. Place cylinder horizontally on work bench. This will prevent any small parts from falling into the cylinder during disassembly.

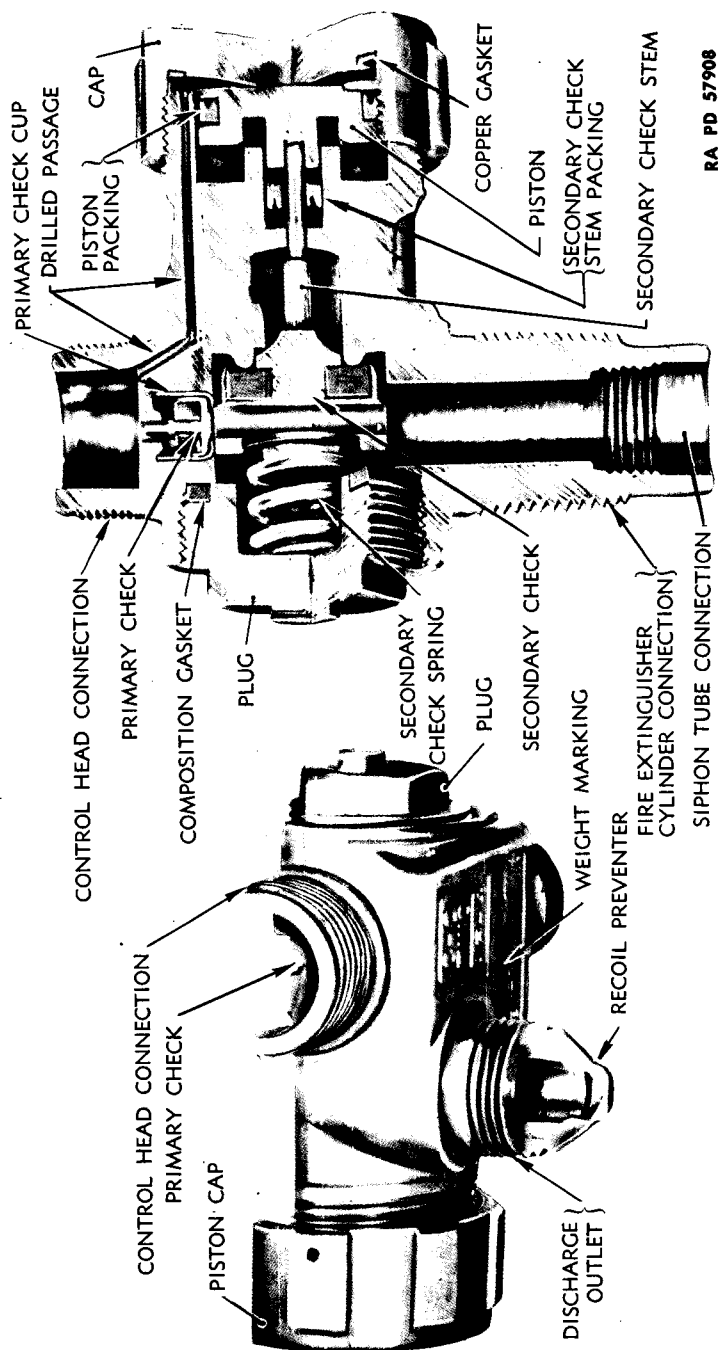
(b) Remove Valve Secondary Check.**PLIERS****WRENCH, box, 1 1/4-in.**

Remove the seal wire (pliers) from plug. Unscrew the plug (1 1/4-in. box wrench) from the body of the valve and remove (with fingers) the following: composition gasket secondary check spring, and the secondary check assembly. This assembly must not be disassembled further.

(c) Remove Piston.**PLIERS****WRENCH, cap, special****ROD, brass, 1/8- x 6-in.**

Remove seal wire (pliers) from the cap. Unscrew the cap (special cap wrench) from the piston end of the valve body and remove cap and copper gasket. Remove piston assembly (brass rod 1/8- x 6-in.) by inserting rod through plug opening, into secondary check stem hole and push piston assembly clear of the valve body. Piston assembly must not be disassembled. Remove secondary check stem packing (brass rod 1/8- x 6-in.) from the recess in the piston end of the valve body.

ORDNANCE MAINTENANCE:
FIRE EXTINGUISHERS



RA PD 57908

Figure 9 — AP-4 Valve — Sectionalized (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(d) Remove Primary Check.****HAMMER****PUNCH, pin**

Place a piece of cardboard over the hole in the plug opening of the valve body, so that it covers the entrance hole to the cylinder. Place pin punch through control head connection of valve body, on primary check stem. Tap lightly (hammer), driving primary check and retainer cup from its recess. Remove check and retainer cup from plug opening of valve body.

(e) Remove Safety Disk.**WRENCH, box, $\frac{1}{8}$ -in.**

Unscrew safety nut ($\frac{1}{8}$ -in. box wrench) from side of valve body. Turn valve over; shake safety disk and safety disk copper washer out into your hand.

(f) Remove Recoil Preventer.**WRENCH, recoil preventer, special**

Unscrew recoil preventer (special recoil preventer wrench) from outlet connection of valve body.

c. Inspection (fig. 8).**(1) PRIMARY CHECK.**

Inspect composition seat. If it is cracked, cut, or deeply grooved, replace check. Inspect primary check retaining cup. If it is bent or loose in the recess, replace.

(2) SECONDARY CHECK.

Inspect composition seat. If it is cracked, cut, or deeply grooved, replace check. Inspect stem. If it is bent or is not free in guide hole, replace secondary check.

(3) SPRING.

Inspect spring. If it has any broken turns or has lost its spring tension, replace.

(4) GASKETS AND PACKING.

Inspect gaskets and packing. Replace any that is not in perfect condition.

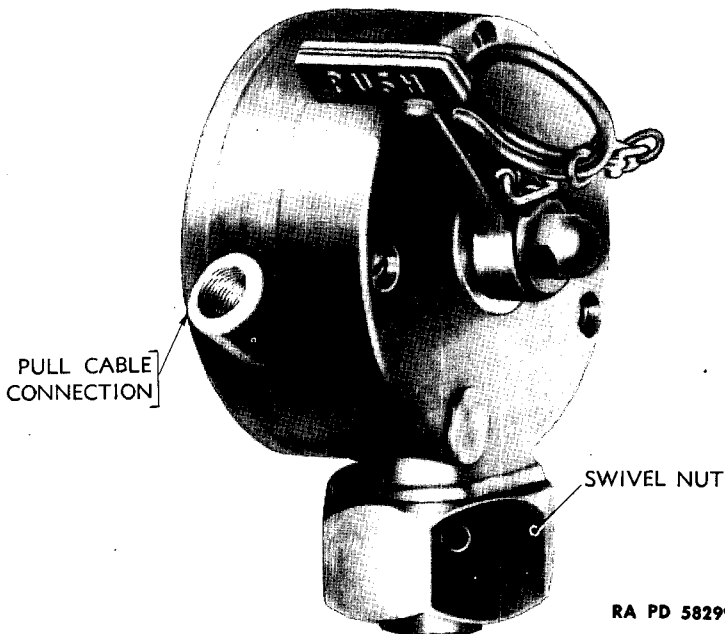
(5) THREADS.

Threads on all parts must be in good condition or the part replaced.

(6) PISTON.

The piston must have free movement in its recess and the composition piston ring perfect. If piston is mutilated it must be replaced.

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS



RA PD 58299

Figure 10 — Control Head (10-Pound C-O-Two Fire Extinguisher)

(7) SAFETY DISK.

Inspect safety disk. If it is wrinkled, bent, or shows any signs that high pressure has been applied, replace the disk. **CAUTION:** Use only standard disks.

(8) RECOIL PREVENTER.

Inspect recoil preventer. If broken, replace.

d. Assembly (fig. 9).

(1) EQUIPMENT.

BAR, brass, $\frac{1}{2}$ -x 10-in.

HAMMER

PLIERS

TOOL, staking

WRENCH, box, $\frac{11}{16}$ -in.

WRENCH, box, $1\frac{1}{4}$ -in.

WRENCH, cap, special

WRENCH, recoil preventer,
special

(2) PROCEDURE.

(a) *Install Primary Check And Retainer.*

BAR, brass, $\frac{1}{2}$ -x 10-in.

TOOL, staking

Place primary check into retainer cup with pin uppermost. Place assembly in recess with stainless steel pin of primary check facing opening into

C-O-TWO FIRE EXTINGUISHERS (CO₂)

control head connection. Place side of brass bar against bottom of retainer cup and tap (hammer) into place. Stake lightly to prevent cup from dropping down on the secondary check.

(b) Install Secondary Check.

WRENCH, box, 1 1/4-in.

Place the check in the plug hole, stem end first, passing the small end of the stem through the small hole and into the piston section of valve body. Place secondary check spring in spring groove of secondary check. Place composition gasket in plug opening and secure by tightly installing plug (1 1/4-in. box wrench) into valve body.

(c) Install Piston Assembly.

WRENCH, cap, special

Place stem packing over secondary check stem, grooved side first, and press into recess. Place piston assembly in its recess and over the stainless steel valve check stem. Place copper gasket in piston cap and tightly screw cap (special cap wrench) over piston.

(d) Install Safety Disk.

WRENCH, box, 1 1/8-in.

Place copper safety disk washer into safety disk hole on the side of valve body. Place safety disk on top of safety disk washer. **NOTE:** These disks are gaged to blow out at a specified pressure; use none but standard disks that are supplied for this purpose. Install safety nut (1 1/8-in. box wrench) over safety disk and tighten securely.

(e) Install Recoil Preventer.

WRENCH, recoil preventer, special

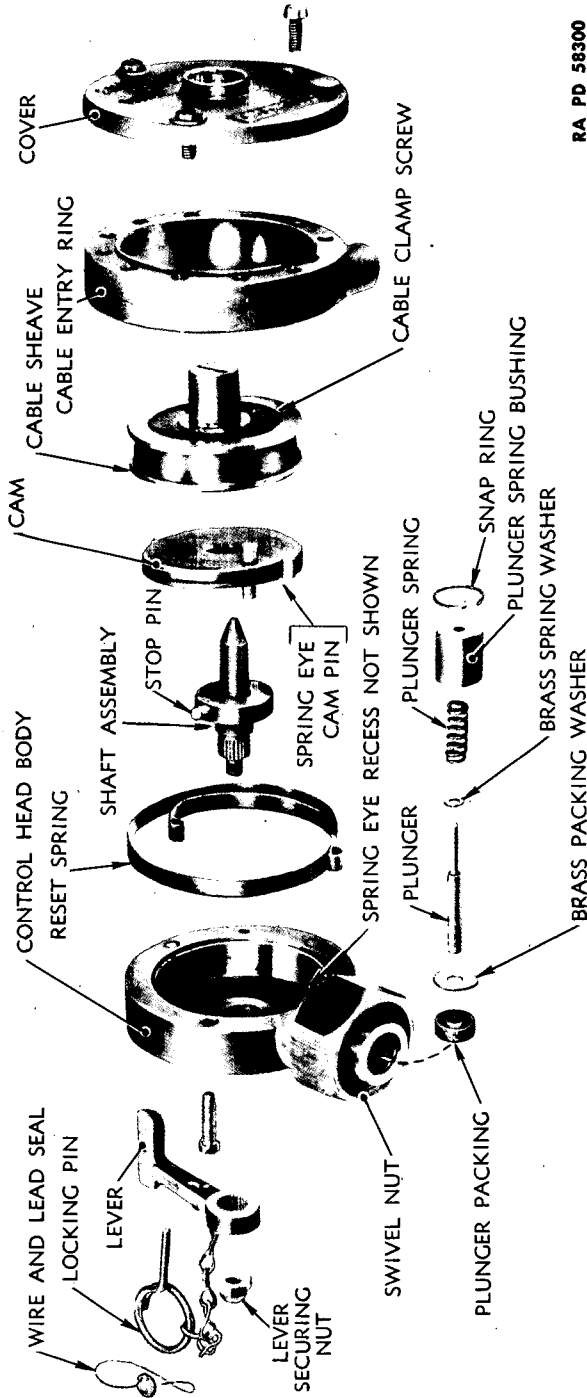
Screw recoil preventer (special recoil preventer wrench) into valve outlet and tighten securely.

(f) Install Fibre Thread Protector On Control Head Connection.

11. CONTROL HEAD, 10-POUND UNIT (fig. 10).

a. Description. The control head is part of the vehicle fire extinguishing system. It has the remote-control cable fastened to it and it is connected to the top of a fire extinguisher cylinder equipped with an AP-4 valve. The body, which is a brass forging, contains a cable sheave, an operating cam, a shaft, lever and a plunger. When the lever or pull cable is pulled it rotates the cam, which in turn moves the plunger. The plunger opens the primary check of the AP-4 valve and starts its action.

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RA PD 58300

Figure 11 — Control Head — Disassembled (10-Pound C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)**b. Disassembly (figs. 10 and 11).****(1) EQUIPMENT.****HACKSAW****SCRIBER****PLIERS****WRENCH**, box, $\frac{7}{16}$ -in.**SCREWDRIVER****(2) PROCEDURE.****(a) Remove Cover Plate And Cable Sheave.**

Remove 3 brass fillister head screws (screwdriver) and remove cover plate. Remove sheave (fingers) from control head body. **NOTE:** Cable was removed from sheave when control head was removed from the vehicle.

(b) Remove Shaft And Cam.**SCREWDRIVER****WRENCH**, box, $\frac{7}{16}$ -in.

Pull locking pin. Remove acorn nut ($\frac{7}{16}$ -in. box wrench) which secures lever to shaft and pry (screwdriver) lever off shaft. Push threaded end of shaft into control head, and remove cam and shaft assembly from the other side. Cam will slide off spring.

(c) Remove Cable Entry Ring.**SCREWDRIVER**

Remove 3 fillister head screws on the lever side of control head and remove ring.

(d) Remove Plunger And Related Parts.**SCRIBER**

Remove lock ring (scriber) from the recess in the valve connection of the control head. Push the plunger from the recess and remove the following: plunger spring bushing, plunger spring, small flat brass spring washer, the plunger, large flat brass gasket washer, and the plunger packing.

(e) Remove Flat Spiral Spring.**PLIERS**

Grasp spring (pliers) near external spring eye and lift spring off pin and out of recess.

(f) Swivel Nut.**HACKSAW****SCREWDRIVER**

Swivel nut on control head cannot be removed without destroying the nut. If threads on nut are damaged beyond use, carefully cut (hacksaw) on both sides and remove in 2 pieces. Then pry (screwdriver) the steel ring from the control head body.

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

c. Inspection And Repair (fig. 11)

(1) INSPECT CONTROL HEAD BODY.

All tapped holes must be in good condition. Retap if necessary. Spring anchor pin in drilled recess must be tight in body. Tighten with hammer and rivet-set, if loose. Inspect threads on swivel nut. If unserviceable replace (subparagraphs b (2) (f) and 11 d (2) (i)).

(2) INSPECT SPIRAL SPRING.

Spring eyes must be in good condition to go over the pins; they must fit tightly in recess of body and tension enough to return the lever and sheave. Replace any weak springs.

(3) SHAFT ASSEMBLY.

Shaft must be free of all nicks, the stop pin in place and not worn, and the threaded end in good condition. Replace shaft if not in this condition.

(4) CAM.

Inspect spring pins and stop pins on cam. Replace cam if pins are badly worn.

(5) SHEAVE.

Inspect setscrew holes and try sheave on shaft for free movement.

(6) COVER PLATE.

Cover plate must not be cracked and holes must line up with those in cable entry ring.

(7) PLUNGER AND RELATED PARTS.

Plunger must be free of all nicks and straight from end to end. Packing must be in perfect condition. Replace bad packing. Washers must slide on plunger freely. Spring must not be broken, bent, or distorted. Replace any spring not in perfect condition. Plunger spring bushing must fit freely in recess of body neck and spring must have free movement in center hole. Replace any mutilated bushing. Snap ring must be free of nicks and fit tightly in its groove.

(8) LEVER.

Lever must not be bent and must have free movement over edge of control head body.

d. Assembly (fig. 11).

(1) EQUIPMENT.

HAMMER

PLIERS

PUNCH, $\frac{1}{8}$ -in.

SCREWDRIVER

WRENCH, box, $\frac{1}{8}$ -in.

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(2) PROCEDURE.****(a) *Install Flat Spiral Spring.*****PLIERS**

Place external eye of spring over steel pin which is mounted in the drilled recess on the cover plate edge of the control head body. Wind spring (pliers) around the inside of the large recess, in a counterclockwise direction. Be sure the second turn of the spring is inside the first turn and that both are pushed all the way to the bottom.

(b) *Install Shaft Assembly.***WRENCH, box, $\frac{7}{16}$ -in.**

Install shaft assembly (with stainless steel stop pin) through center hole in large recess, threaded end first. Place shaft with steel pin pointing to the top of the control head body. Place lever on shaft in temporary position while installing the balance of parts. Secure with acorn nut ($\frac{1}{8}$ -in. box wrench).

(c) *Install Cam.***SCREWDRIVER**

Place the cam on the recess end of the shaft with the two-pin face innermost. Guide the inner eye of the flat spiral spring (screwdriver) so the smaller pin on the inside face of the cam will enter the spring eye and push cam to the bottom.

(d) *Install Cable Entry Ring.***SCREWDRIVER**

With cam held firmly in position, install cable entry ring on control head body with the cable entry hole in the desired position. Secure with 3 fillister head machine screws (screwdriver); install from the lever side of the body.

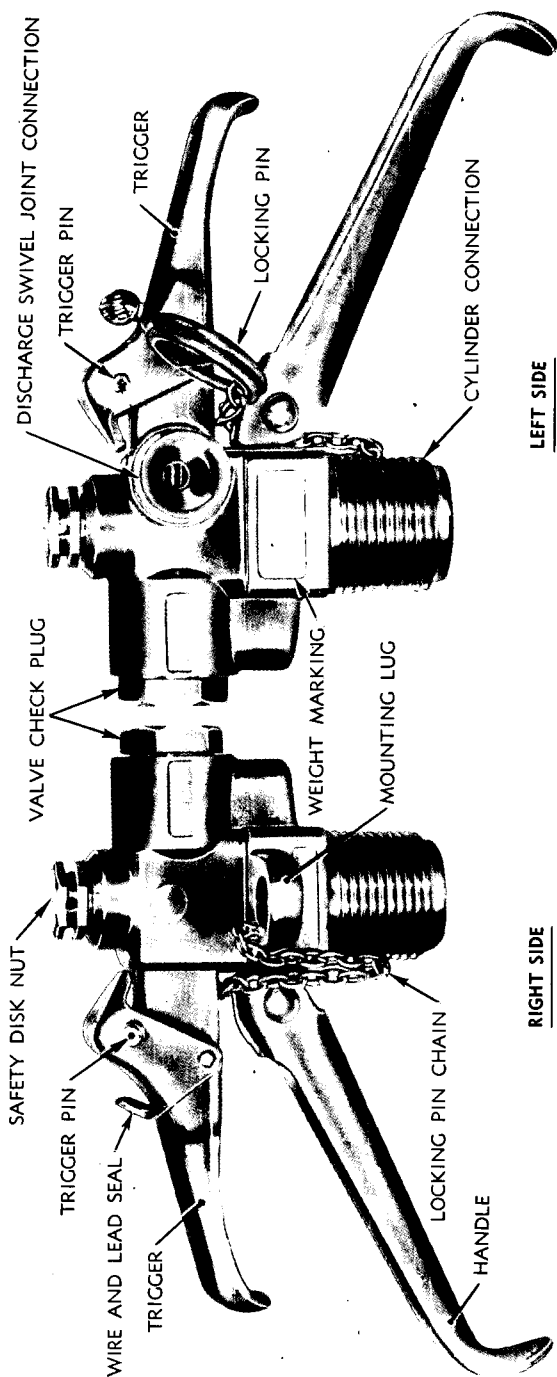
(e) *Install Sheave.***SCREWDRIVER**

Install 2 brass setscrews (screwdriver) in sheave and place it over the inside end of shaft. **NOTE:** Cable will be attached at time control head is installed on vehicle.

(f) *Install Cover Plate.***SCREWDRIVER**

Place cover plate over ring and sheave, and secure with 3 brass fillister head machine screws (screwdriver).

ORDNANCE MAINTENANCE:
FIRE EXTINGUISHERS



RA PD 301484

Figure 12 — PS-4 Valve (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(g) Install Plunger And Related Parts.****PLIERS****SCREWDRIVER**

Place packing on plunger with the grooved face toward the small end. Place the large flat brass gasket washer on the large section of the plunger and against the grooved face of the packing. Place the small flat brass spring washer over the small section of the plunger and against the shoulder of the large section. Place the plunger spring over the small section of the plunger and against the small flat washer. Place the plunger spring bushing over the spring and with the small end of the plunger through the small hole. Insert this assembly into the recess in the valve connection of the control head and secure by installing snap ring (pliers and screwdriver) in groove of recess.

(h) Set Lever In Proper Position.**PLIERS****WRENCH, box, $\frac{7}{16}$ -in.****SCREWDRIVER**

Remove lever ($\frac{7}{16}$ -in. box wrench and screwdriver) from its temporary setting on shaft. Turn the sheave shaft (pliers) that protrudes through cover plate, counterclockwise until the arrow on the shaft points straight to the top. Turn lever shaft (fingers) in a clockwise direction until it hits its stop pin. Install the lever on the shaft in a position, so that the locking pinhole in the lever is directly over the locking pinhole in the control head body. Secure lever to shaft by tightly installing acorn nut ($\frac{7}{16}$ -in. box wrench).

(i) Install Swivel Nut.**HAMMER****PUNCH, $\frac{1}{8}$ -in.**

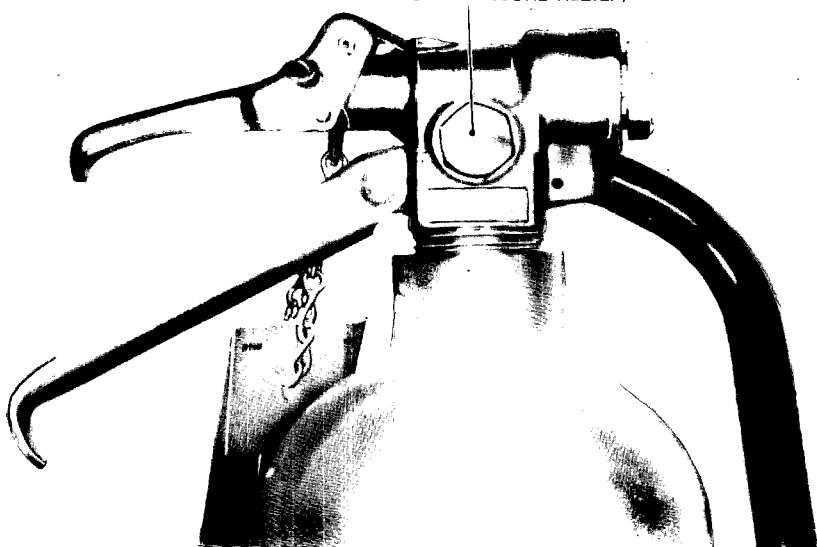
Place new swivel nut in position on the neck of the control head body, with the groove in the nut in line with the groove in the neck. Insert $\frac{1}{8}$ -in. stainless steel pin in the hole on the swivel nut, rounded end first. Drive pin (hammer) all the way in, make final setting with $\frac{1}{8}$ -inch punch.

(j) Check Control Head.

Watch plunger pin while moving lever one half revolution, in a clockwise direction from the locking pin position. If pin moves $\frac{3}{16}$ inch and the spring returns the lever to its locking pin position when released, the assembly has been followed correctly and the unit is ready for service. Install locking pin through lever and into control head body, and secure with seal wire.

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS

SAFETY NUT (PRESSURE RELIEF)



RA PD 58302

Figure 13 — Safety For PS-4 Valve (C-O-Two Fire Extinguisher)

12. PS-4 SQUEEZE GRIP VALVE, 4-POUND UNIT.

a. **Description** (figs. 12 and 13). The PS-4 squeeze grip valve is mounted on the portable fire extinguishers and controls the discharge of carbon dioxide gas. The body is a brass forging and contains a valve check with plunger which is opened by the squeezing of the trigger and is returned to the closed position by the gas pressure. A heavy spring mounted behind the check keeps the check closed when the cylinder is empty. A safety disk is mounted on the side of the valve, of early production; on valves of later production this safety is mounted on the top. This safety disk is calibrated to rupture and discharge the cylinder if internal pressure of cylinder exceeds 2,600 pounds. The valve is also equipped with a swivel joint, to which the discharge horn is connected.

b. Disassembly (figs. 12 and 13).

(1) EQUIPMENT.

HACKSAW
HAMMER
PLIERS
PUNCH, pin
PUNCH, rivet, $\frac{3}{16}$ -in.
SCREWDRIVER
WHEEL, emery

WRENCH, box, $\frac{1}{8}$ -in.
WRENCH, box, $\frac{7}{8}$ -in.
WRENCH, box, 1-in.
WRENCH, pipe, 6-in.
WRENCH, special, diffusion
button

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(2) PROCEDURE.**

(a) Cylinder must be completely empty before starting any disassembly.

(b) Remove Safety Disk.

WRENCH, box, $\frac{1}{8}$ -in.

Part of the production on these valves, the safety disk is placed on the top of the valve body and the others have them placed on the side. Unscrew the safety nut ($\frac{1}{8}$ -in. box wrench) and remove. Turn valve over, and the safety disk and the safety disk washer will fall out.

(c) Remove Valve Check.

WRENCH, box, $\frac{7}{8}$ -in.

Unscrew valve check plug ($\frac{7}{8}$ -in. box wrench) from the valve body. With your fingers, remove the valve check with valve check spring, from the plug hole. Turn valve over and shake copper plug gasket from plug hole.

(d) Remove Valve Stem Packing.

HAMMER

SCREWDRIVER

PUNCH, pin

WRENCH, spanner

Remove seal wire from trigger and pull locking pin. Support trigger on a steel block with the steel pin over a $\frac{1}{2}$ -inch hole, and drive trigger pin (hammer and pin punch) from trigger and valve body. Remove trigger from valve body. Unscrew packing nut (screwdriver or spanner wrench) from valve body and remove. **NOTE:** On valves of early production, the spanner wrench is necessary; on later production a screwdriver is needed. Remove packing from packing nut opening (pin punch).

(e) Remove Handle.

HACKSAW

PUNCH, rivet, $\frac{3}{16}$ -in.

HAMMER

WHEEL, emery

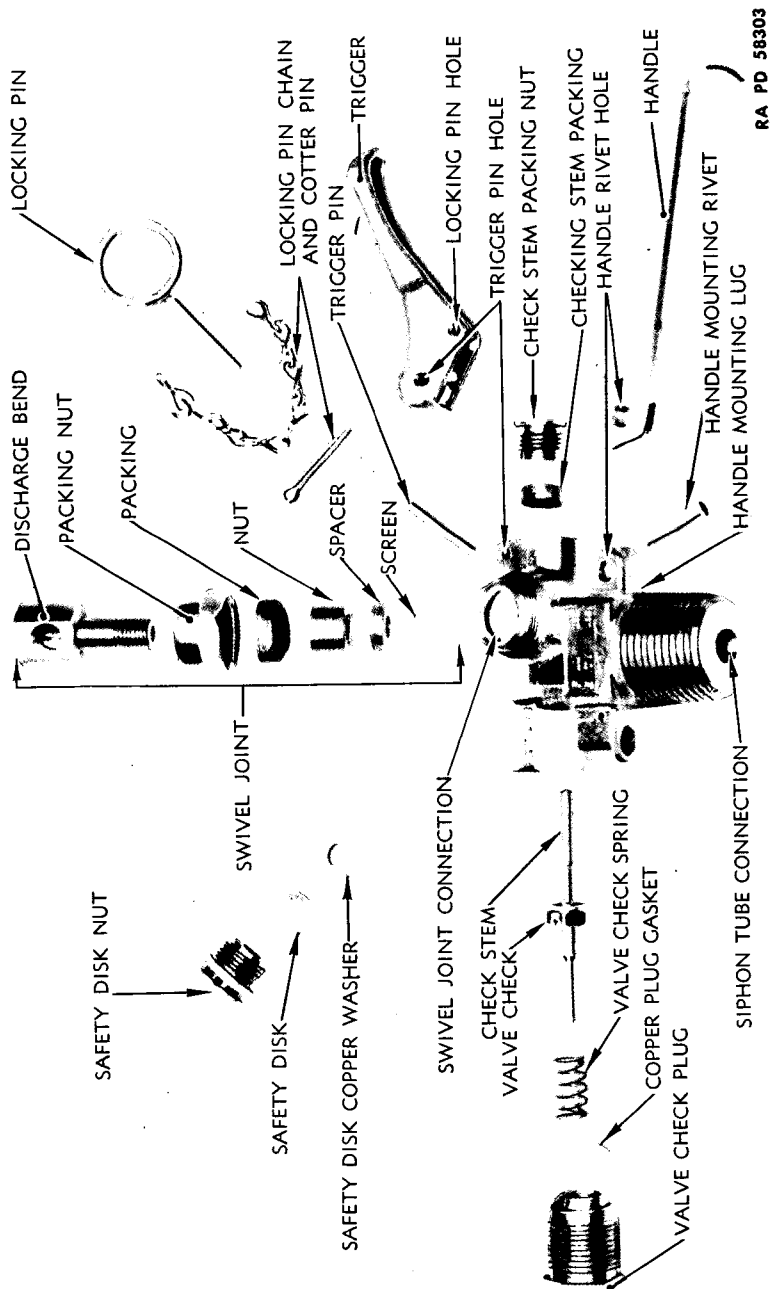
Remove head of rivet (emery wheel or hacksaw) which secures handle to valve body. Support handle lug on the steel block, with rivet over a $\frac{1}{2}$ -inch hole and drive out rivet (hammer and $\frac{3}{16}$ -in. rivet punch). Remove handle from valve body.

(f) Remove Chain And Locking Pin.

PLIERS

Straighten and pull cotter pin (pliers) from mounting lug on valve body.

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FIRE EXTINGUISHERS



RA PD 58303

Figure 14 — PS-4 Valve — Disassembled (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(g) Remove Horn And Swivel Joint.****WRENCH**, box, 1-in.**WRENCH**, special, diffusion**WRENCH**, pipe, 6-in.

button

Unscrew discharge horn from discharge tube (by hand). Unscrew diffusion button (diffusion button special wrench) from lower end of discharge tube. Unscrew discharge tube (6-in. pipe wrench) from discharge bend bushing. Unscrew packing nut (1-in. box wrench) from valve body and remove. Turn valve over and shake out spacer and screen from valve outlet. Place discharge bend bushing in vise and remove threaded bushing (6-in. pipe wrench), packing, and the packing nut.

c. Inspection (figs. 14 and 15).**(1) INSPECT VALVE STEM ASSEMBLY.**

Inspect composition seat. If it is worn or dented deeply, replace valve stem assembly. Inspect steel stem. It must be straight and free of nicks and have free movement in its guide hole. Replace if it does not meet these conditions. Brass end on assembly is mounted loose, but not removable, replace valve stem assembly if it is not secure.

(2) SPRING.

Inspect spring. If it has any broken turns or its spring tension is lost it must be replaced.

(3) GASKETS AND PACKING.

Inspect gaskets and packing. Replace any that is not in perfect condition.

(4) THREADS.

Threads on all parts must be in good condition or the part replaced.

(5) SAFETY DISK.

Inspect safety disk. If it is wrinkled, bent, or shows any sign that high pressure has been applied, replace the disk. **CAUTION:** Use only standard disks.

(6) RECOIL PREVENTER.

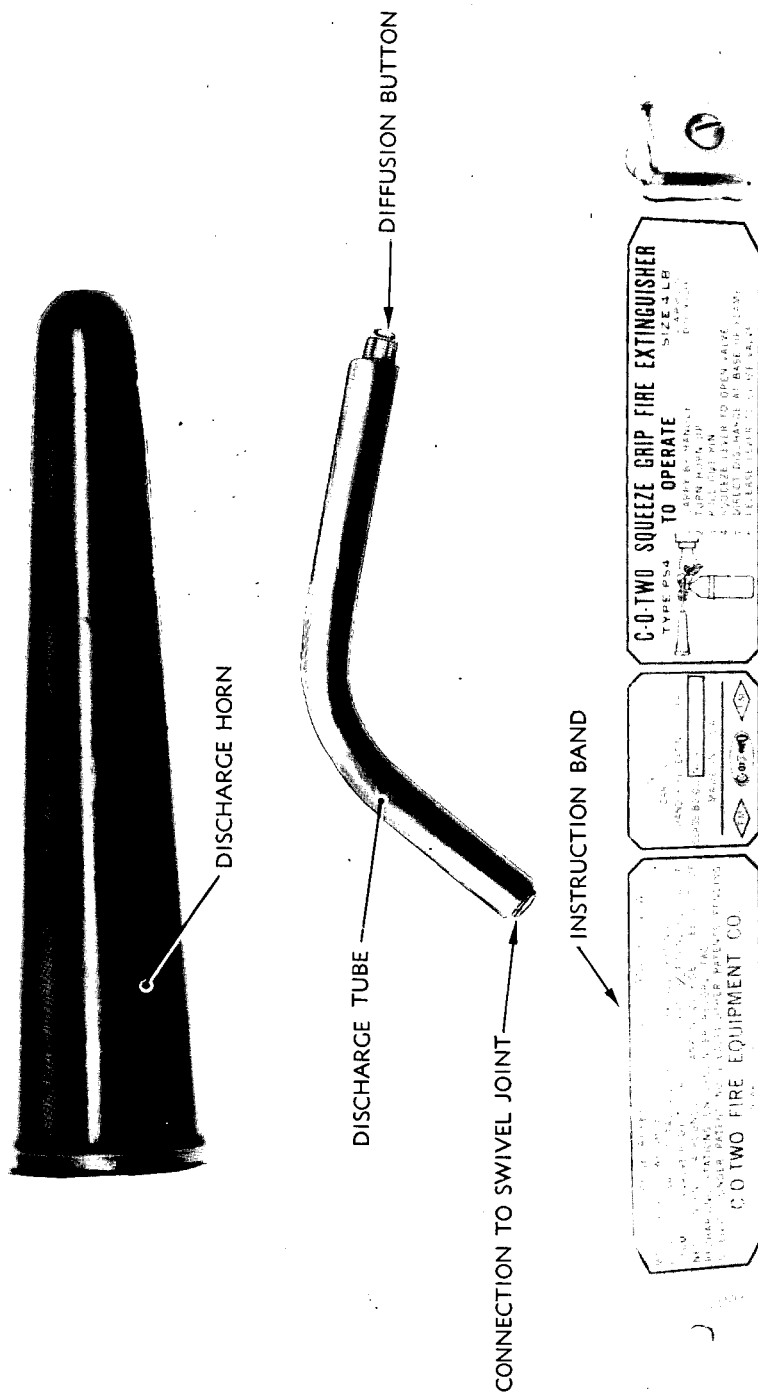
Inspect recoil preventer and if broken, replace.

(7) HANDLE AND TRIGGER.

Replace any broken or mutilated handle or trigger.

a. Assembly. (figs. 14 and 15).

ORDNANCE MAINTENANCE: FIRE EXTINGUISHERS



**Figure 15 — Discharge Tube And Horn, And Operation Instruction Band
(C-O-Two 4-Pound Portable Fire Extinguisher)**

RA PD 58304

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(1) EQUIPMENT.****HAMMER****PLIERS****SCREWDRIVER****TOOL**, setting rivet**WISE**, soft jaw**WRENCH**, box, $\frac{1}{8}$ -in.**WRENCH**, $\frac{7}{8}$ -in.**WRENCH**, box, 1-in.**WRENCH**, pipe, 6-in.**WRENCH**, spanner**WRENCH**, special, diffusion
button**(2) PROCEDURE.****(a) Install Safety Disk.**

In later production of these valves, the safety disk is placed on the top of the valve body and the others had them placed on the side. Install safety disk copper washer in the safety disk opening; then place safety disk on top of the copper washer. Secure by tightly installing safety disk nut ($\frac{1}{8}$ -in. box wrench).

(b) Install Valve Check.**WRENCH**, box, $\frac{7}{8}$ -in.

Install valve check spring over the brass end of the valve check. Hold the valve check by its brass end and insert it through the plug opening, steel end first. When valve check is seated, the steel end will project about one-quarter inch past the packing nut opening. Install copper gasket in plug hole, making sure gasket lays flat. Secure by tightly installing valve check plug ($\frac{7}{8}$ -in. box wrench).

(c) Install Packing Nut, And Trigger.**HAMMER****SCREWDRIVER****TOOL**, setting rivet**WRENCH**, spanner

Place new valve stem packing over the projecting steel end of the valve check stem and press into packing recess. The grooved face of the packing goes on first. Place packing nut over steel stem and securely tighten (screwdriver or spanner wrench). **NOTE:** This packing nut is not an adjustment nut, and must be taken up tight. Place trigger in position over packing nut, with the trigger pinhole lined up with the hole in the valve body above the packing nut. Insert trigger pin through trigger and valve body. Set brass of handle tightly around trigger pin (rivet setting tool). This pin does not project past the trigger and must not be riveted. Raise trigger, insert locking pin, and secure with sealing wire.

(d) Swivel Joint And Horn.**WISE**, soft jaw**WRENCH**, box, 1-in.**WRENCH**, pipe, 6-in.**WRENCH**, special, diffusion
button

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FIRE EXTINGUISHERS

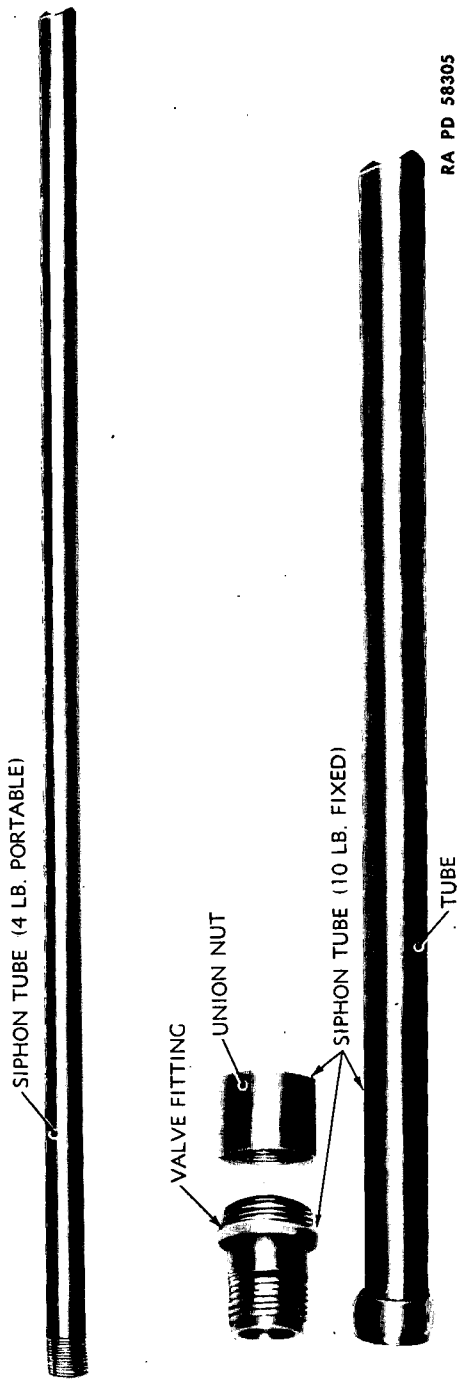


Figure 16 — Siphon Tubes (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)

Place discharge bend bushing in soft jaw vise and screw the discharge tube (6-in. pipe wrench) into the tapped hole. Place packing nut over the small section of the discharge bend bushing, small opening on first. Place packing over discharge bend bushing, flat side on first, and push into the bottom of the packing nut. Screw threaded bushing (6-in. pipe wrench), concave face first, tightly onto threaded end and flush with the end of the discharge bend bushing. Insert screen and then brass spacer into discharge outlet of valve body. Insert discharge bend bushing assembly into discharge outlet of valve and secure by screwing packing nut (1-in. box wrench) on valve body. The packing nut must be taken up tight, but not so tight that the discharge tube and horn can not be moved. Screw diffusion button (diffusion button special wrench) into end of discharge tube. Place washer in small end of discharge horn and screw horn onto discharge tube.

*(e) Install Handle.***HAMMER**

Place handle in position on lug of valve, below trigger, with the rounded side away from the trigger. Place rivet through handle and lug and set the rivet (hammer). Do not rivet too tightly. The handle must move.

*(f) Install Chain.***PLIERS**

Insert cotter pin (on end of locking pin chain) in mounting lug on valve body and bend the protruding section 90 degrees.

13. SIPHON TUBE.**a. Equipment.**

LEAD, white, or other thread	WRENCH, pipe, 6-in.
sealing compound	WRENCH, pipe, 12-in.
WRENCH, open-end, 1-in.	WRENCH, special,
WRENCH, open-end, 1 $\frac{3}{8}$ -in.,	
with 2-ft. handle	

b. Procedure.**(1) SIPHON TUBE ON THE SQUEEZE GRIP VALVE.***(a) Description.*

This tube is a $\frac{1}{8}$ -inch copper tube, threaded on one end and cut at an angle at the other end. It is long enough to extend from the valve, where it is securely fastened by the threaded end, to $\frac{3}{8}$ inch from the bottom of the cylinder. Its purpose is to allow the complete discharge of the liquid carbon dioxide; therefore, it is necessary that the extinguisher be held in an upright position when being discharged.

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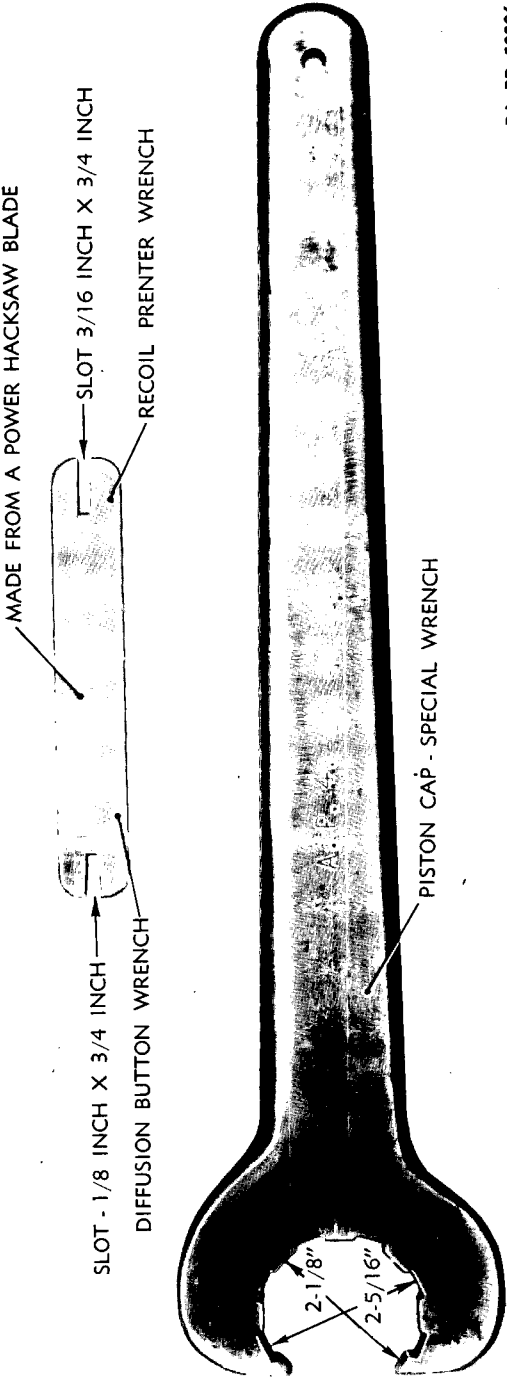


Figure 17 — Special Tools (C-O-Two Fire Extinguisher)

C-O-TWO FIRE EXTINGUISHERS (CO₂)**(b) Inspection.**

Shake cylinder; if a rattling noise is heard, the siphon tube is broken. Replace siphon tube.

(c) Remove Siphon Tube.

Do not remove siphon tube or valve, unless after inspection it is found necessary.

WRENCH, open-end, 1 $\frac{3}{8}$ -in.,
with 2-ft. handle

WRENCH, pipe, 6-in.

Clamp fire extinguisher securely to the work bench (do not use a vise). Unscrew extinguisher valve (1 $\frac{3}{8}$ -in. open-end wrench with 2-ft. handle) from cylinder and remove valve and siphon tube. If any part of the tube remains in the cylinder, turn it upside down and remove all parts. Remove siphon (pipe wrench) from valve.

(d) Install Siphon Tube.

LEAD, white, or other thread
sealing compound

WRENCH, open-end, 1 $\frac{3}{8}$ -in.,
with 2-ft. handle

WRENCH, pipe, 6-in.

Screw threaded end of new siphon tube (6-in. pipe wrench) into base of the extinguisher valve. The tube proper is $\frac{3}{4}$ -inch copper and valve body and screw it into the neck of the cylinder. Tighten (1 $\frac{3}{8}$ -in. open-end wrench, with 2-ft. handle) securely.

(2) SIPHON TUBE ON AP-4 VALVE (fig. 16).**(a) Description.**

This tube is made up as an assembly. A fitting is screwed into the base of the extinguisher valve. The tube proper is $\frac{3}{4}$ -inch copper and long enough to reach within $\frac{1}{2}$ inch of the bottom of the cylinder. There is a ball fitting soldered to the upper end of the tube. The tube is secured to the fitting by a special nut which allows the tube some free motion. This construction permits the mounting of the fire extinguisher in either an upright or horizontal position as the lower end of the siphon tube will drop to the lowest point.

(b) Inspection.

Shake cylinder and if a loud rattling noise is heard, the siphon tube is broken. Replace or tighten. If the noise is slight it is the tube moving on the universal nut; in this case it will not have to be removed.

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(c) Remove Siphon Tube.

WRENCH, pipe, 12-in.

WRENCH, special

WRENCH, open-end, 1-in.

NOTE: Do not remove siphon tube or valve, unless inspection finds it necessary.

Clamp fire extinguisher securely to the work bench (do not use a vise). Unscrew extinguisher valve (special wrench) from cylinder valve and siphon tube. If any part of the tube remains in the cylinder, turn it upside down and remove all parts. Remove siphon tube (12-in. pipe wrench) from fitting.

(d) Install Siphon Tube.

LEAD, white, or other thread
sealing compounds

WRENCH, pipe, 12-in.
WRENCH, special

Install union nut on siphon tube and secure to fitting (12-in. pipe wrench) on base of valve. Apply white lead to threaded section of valve body and screw it into the neck of the cylinder. Tighten (special wrench) securely.

Section III

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

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14. DESCRIPTION.

a. These fire extinguishers as manufactured by Walter Kidde and Company are the following:

Ordinance No.	Type	Size	Manufacturer's Identification
B183325	Fixed	10 lb	79120
D38702	Fixed	7½ lb	23860
D37127	Portable	4 lb	79143

NOTE: The following text will apply to all three extinguishers unless specifically stated otherwise.

b. Extinguishers No. B183325 (10-Pound Size) And D38702 (7½-Pound Size).

(1) These extinguishers are alike with exception of size and control. No. B183325 extinguisher is a 10-pound unit, equipped to receive a control head for either remote control, or hand control at the cylinder. No. D38702 is a 7½-pound unit and is equipped to receive a handwheel control head for control at the cylinder only.

(2) The cylinders are made of steel and have a flat bottom. Part of later production have rounded bottoms and cannot be set on end. They are provided with a valve to retain the gas. Should the gas pressure become excessive, due to high temperature, a safety disk is provided in the valve to release the gas before the cylinder test pressure is reached.

(3) A siphon tube extends from the cylinder valve to the bottom of the cylinder as a means of discharging the liquid carbon dioxide.

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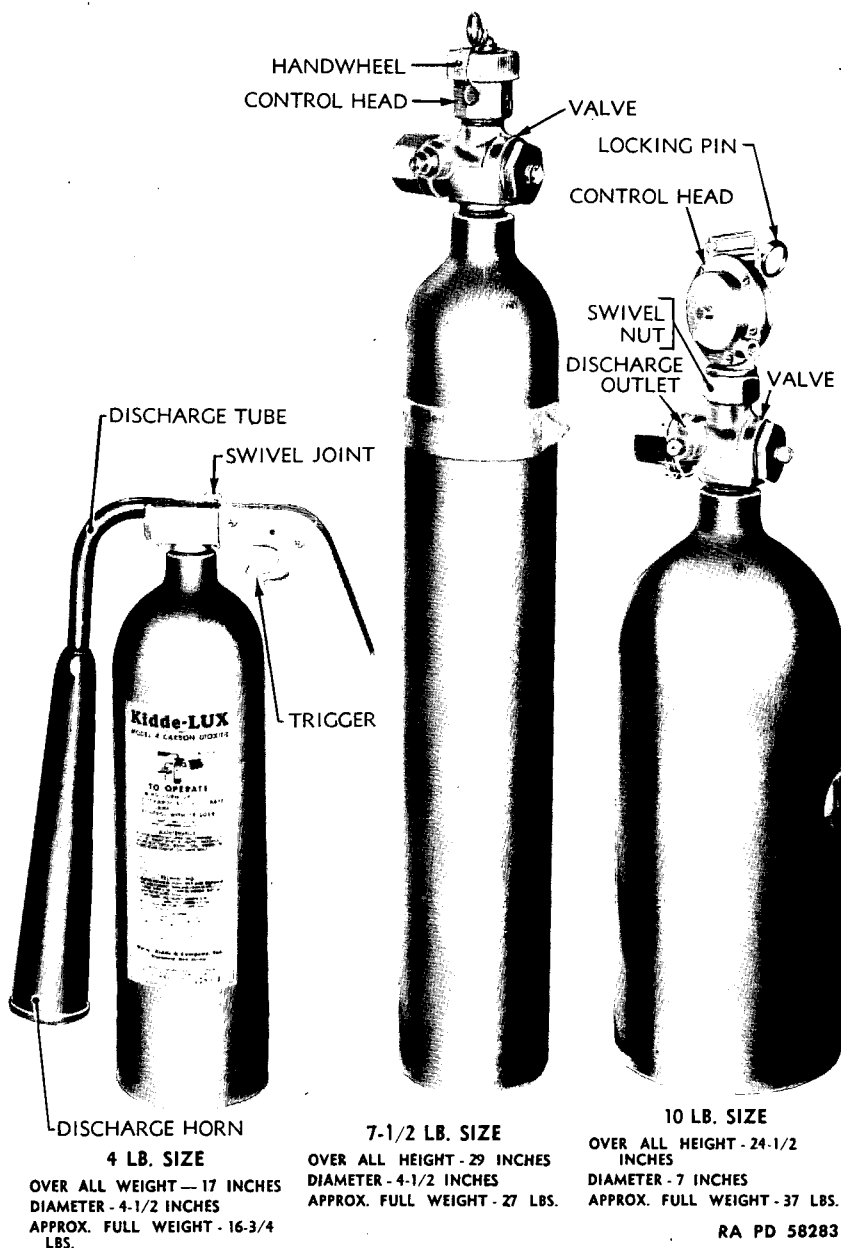


Figure 18 — Kidde-Lux Fire Extinguishers

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

(4) A control head is secured to the cylinder valve as a means of opening the valve. Once this valve is opened the entire contents of the cylinder is discharged. When the cylinder is connected to the tubing of the vehicle fire-control system, the gas (carbon dioxide), is delivered and discharged from the nozzles of the system.

(5) These extinguishers use carbon dioxide as an agent for fighting fire.

c. Extinguisher D37127 (4-Pound Size).

(1) This extinguisher is of the portable type, made in cylindrical form of steel. It has a flat bottom so that it can be placed in an upright position.

(2) The cylinder is provided with a valve to retain the gas (carbon dioxide). Should the pressure become excessive, due to high temperature, a safety disk is provided in the valve to release the gas before the cylinder test pressure is reached.

(3) The cylinder valve is equipped with a handle which embodies a trigger, to operate a cam. This cam opens the discharge valve.

(4) A siphon tube extends from the cylinder valve to the bottom of the cylinder as a means of discharging liquid carbon dioxide.

(5) A tube and horn assembly is attached to the cylinder valve outlet, on a swivel joint and is used to direct the gas on the fire.

(6) A special seal wire is used to lock valve trigger in the "OFF" position. This cylinder valve passes carbon dioxide only when the trigger on the handle is pulled and held. A broken seal wire indicates cylinder has been in use.

(7) This extinguisher uses carbon dioxide as an agent for fighting fire.

15. OPERATION.

a. The operation of all 3 units is dependent entirely on manual operation; therefore it is imperative that there be as little delay as possible in discharging the gas (carbon dioxide), as its effectiveness is materially increased by catching the fire in the beginning.

b. **Operation of Extinguisher No. B183325 (10-Pound Size).** Pulling cable (connected to remote-control handle) or manual lever at cylinder, rotates a cam within the control head. This cam depresses the pilot plunger and unseats the pilot check. The carbon dioxide gas flows past the pilot check and passes through a drilled passage in the valve body, to the head of the valve piston. The pressure of carbon dioxide moves the piston and piston pin. The piston pin contacts and unseats

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the main check. The full flow of gas then passes through the valve outlet. Tubing conducts the gas to shielded discharge nozzles for effective distribution. The above operation can also be started by pulling lockpin on control head and rotating lever.

c. Operation Of Extinguisher No. D38702 (7½-Pound Size).

(1) This extinguisher has only a hand control head. To set in operation, pull locking pin (breaking sealing wire) and turn handwheel counterclockwise until it bottoms. From this point on action is the same as extinguisher No. B183325 as explained in the preceding step.

d. Operation Of Extinguisher No. D37127 (4-Pound Size) (fig. 2). The pulling of the trigger in the handle of the extinguisher will break the sealing wire and move a cam. The cam moves a pin, which in turn contacts and unseats the main check. The carbon dioxide then passes through the valve to the tube, nozzle and horn, from which the operator directs the gas on the fire. A coating of snow must be applied to the scene of the fire to prevent reignition. For further information refer to paragraph 5.

16. EFFECT OF CARBON DIOXIDE ON PERSONNEL.

a. Refer to paragraph 6.

17. MAINTENANCE (PREVENTIVE).

a. Restore The System To Its Normal Ready-to-operate Condition (Extinguisher No. B183325).

(1) Disconnect control head from valve by turning swivel nut (right-hand thread). Raise clear of cylinder valve and support control head and cable tubing in approximately normal position. Remove connecting tube between double-check tee (2-cylinder installation) and valve outlet. **CAUTION:** Never remove cylinder with this connecting tube attached to cylinder valve outlet. Remove cylinder clamps; then remove cylinder.

(2) While control head is disassembled from cylinder, remove cover exposing the cam (fig. 23). Check cable clamp setscrews to make certain cable does not pull out of clamp (narrow screwdriver). After replacing cover, pull remote-control handle to make certain that cable does not bind. The cam inside the control head should rotate and pin advance.

(3) Reset all control handles. Reset control head by inserting a pin or nail in control head shaft. Turn counterclockwise (looking at manual lever side of control head) until clutch pin and arrow are lined up, as shown in figure 23. If the valve has been operated by the pull lever, install pull-out pin and seal wire.

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(4) Set cylinder in place and tighten clamp hand-tight to allow for turning of cylinder that may be required in connecting tubing. Replace connecting tube between double-check tee and valve outlet. Tighten cylinder clamp securely. **CAUTION:** Make certain control head is in set position (pin lined up with arrow as shown in figure 23) before installing. Insert control head in cylinder valve. Before tightening swivel nut, check to see that control head has remained in set position. Then tighten swivel nut securely.

b. Periodic Inspection.

(1) Check red cap on safety disk outlet of valve. If not intact, the cylinder has been prematurely discharged due to high temperature and must be replaced by a fully charged cylinder.

(2) Inspect entire system for any mechanical damage. Make sure that shielded nozzles are free of all foreign matter.

(3) Weigh cylinders to determine the carbon dioxide content. Do not attempt to determine content by means of a pressure gage. Empty weight and carbon dioxide charge are stamped on cylinder valve body.

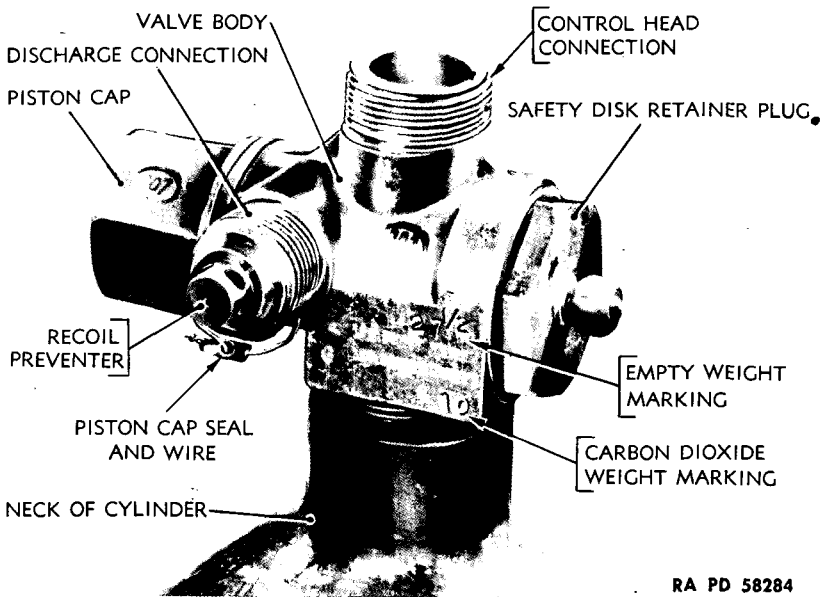
(a) Disconnect control head from cylinder (subpar. a (1) above).

(b) Weigh cylinders, and subtract from this weight the empty weight that is stamped on the valve body. Empty weight includes valve and cylinder, but does not include the control head. If the resulting net weight has decreased to below 9 pounds on the 10-pound unit, the cylinder must be recharged to its full rated capacity of 10 pounds. The loss on any size cylinder should not be over 10 per cent; if more it must be recharged to its full rated weight.

(c) While control heads are disassembled from cylinder, remove the cover exposing the cam (fig. 23). Check cable clamp screws to make sure that cable does not pull out of clamp (narrow screwdriver). After replacing cover, pull remote control handle to make sure that the cable does not bind. The cam inside the control head should rotate, and pin should advance. Reset control as described in subparagraph a (3) above.

c. Extinguisher No. D38702 (7½-Pound Size). The information contained in steps a and b above, will apply to extinguisher No. D38702, except that which is pertinent to remote control. This unit is controlled at the cylinder only. Also in weighing cylinder, the resulting net weight of a fully-charged unit is 7½ pounds. Handwheel control head must not be on when weighing. Any cylinder showing a ¾-pound or more loss in its charge, must be recharged to its full-charge rating before again being placed in service.

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Figure 19 — Kidde-Lux Valve (7½- And 10-Pound Extinguishers)

d. **Extinguisher No. D37127 (4-Pound Size).** Check seal wire. If broken it indicates extinguisher has been in use. Weigh cylinder to check loss of charge. If loss is ¼ pound or more, cylinder should be recharged to its full weight (full weight of cylinder is stamped on side of valve body and includes the discharge horn).

18. CHARGING CYLINDERS.

a. Refer to paragraph 8.

19. KIDDE-LUX VALVE, 10-POUND AND 7½-POUND UNIT.

a. **Description.** The valves on these 2 fire extinguishers are alike in all respects, with exception to weight marking stamped on the body. The body is a brass casting containing a primary check, drilled passage, operating piston, and a secondary check. The primary check is opened by plunger pin of the control head. This permits the carbon dioxide in the cylinder to pass through the drilled passage to the head of the piston. The pressure of carbon dioxide on the piston forces the piston pin against, and opens the secondary check, permitting the entire content of the cylinder to be discharged through the discharge outlet. The valve is equipped with a safety disk, which will rupture and discharge the entire

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content of the cylinder, if internal pressure exceeds 2,600 to 2,900 pounds. A recoil preventer is screwed into the valve outlet, to prevent rocketing in case the valve is turned on when the cylinder outlet is not connected to a discharge system. The valve is permanently mounted in the cylinder.

b. Disassembly (fig. 19). NOTE: Be sure fire extinguisher is completely empty before starting any disassembly.

(1) EQUIPMENT.**PLIERS****SCREWDRIVER, 4-in.****PLUG, cork, 5/8-in.****WRENCH, box, 1 1/2-in.****PUNCH, pin, 3/16-in.****WRENCH, box, 1 5/8-in.****(2) PROCEDURE.****(a) Remove Safety Disk (fig. 19).****WRENCH, box, 1 5/8-in.**

Unscrew safety disk retainer plug (1 5/8-in. box wrench) and remove retainer plug, retainer (pliers), retainer plug gasket and safety disk.

(b) Remove Secondary Check.

Remove secondary check spring and secondary check (fingers) from the retainer plug opening.

(c) Remove Primary Check.

The primary check is held in its recess by a small wire pin, which is placed in a drilled hole starting at the seating surface of the safety disk gasket and continuing across the primary check recess. Place a cork plug, or your finger, in the valve opening leading to the cylinder. This will prevent the primary check from falling into the cylinder. Turn valve body with retainer plughole downward, shake the valve slightly, and the retainer wire will drop out. Remove primary check from retainer plughole (fingers).

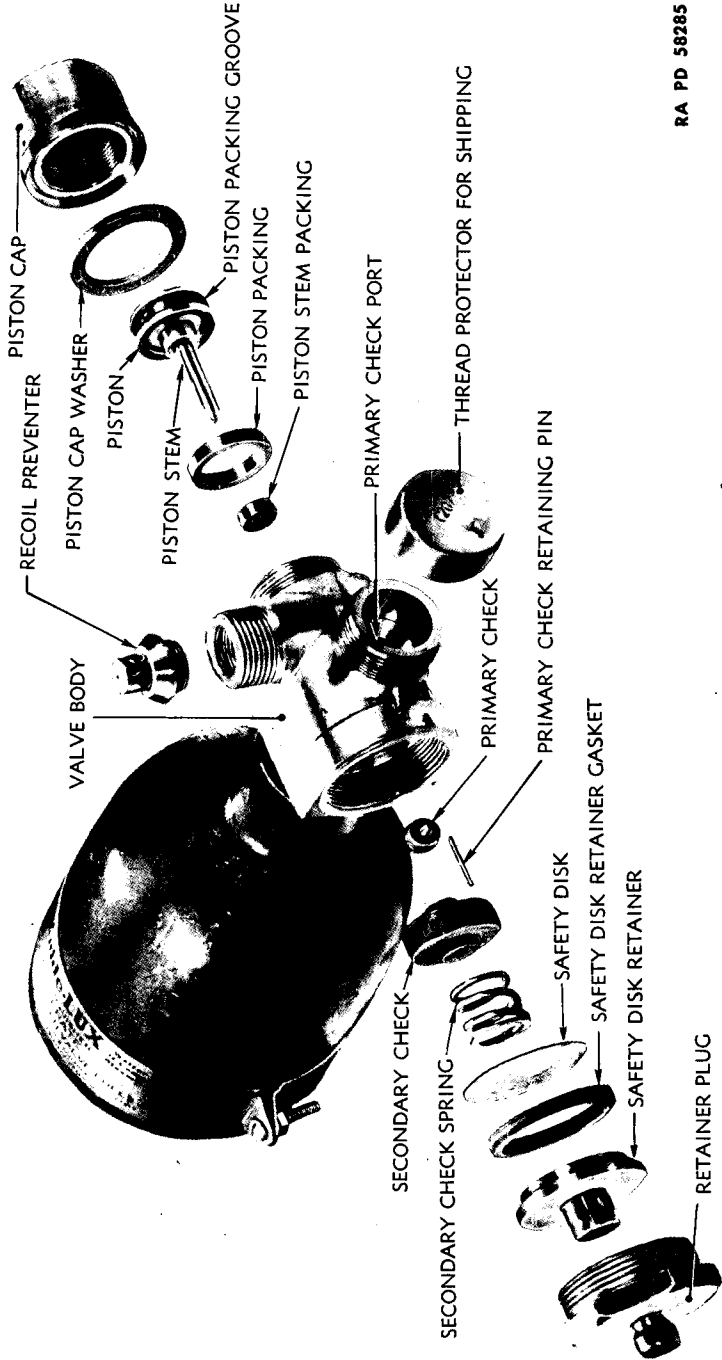
(d) Remove Recoil Preventer.**PUNCH, pin, 3/16-in.**

Unscrew valve outlet protector (by hand) and remove. Insert 3/16-inch pin punch through the 2 holes in the recoil preventer and unscrew.

(e) Remove Thread Protector From Control Head Connection (By Hand).**(f) Remove Piston.****PLIERS****WRENCH, box, 1 1/2-in.**

Break sealing wire (pliers) and remove it from the piston cap. Unscrew piston cap (1 1/2-in. box wrench) from valve body and remove. Remove

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Figure 20 — Kidde-Lux Valve — Disassembled (7 1/2- And 10-Pound Extinguishers)

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piston cap washer from piston cap (fingers). Hold the piston cap in the left hand and grasp the steel piston stem in the right hand, wiggle and pull piston assembly from piston cap.

(g) Remove Piston And Piston Stem Packings.

Remove the packing (4-in. screwdriver) from piston by gently prying over the face of the piston. Remove piston stem packing (4-in. screwdriver) from the recess of valve body at the piston end. This packing is normally soft. If it is hard it can be destroyed when removing.

c. Inspection (fig. 20).

(1) CHECKS.

Inspect composition seat on primary and secondary checks for cracks, bad scratches, embedded foreign material, or broken seat. Replace any check that is not in perfect condition.

(2) RETAINER PLUG GASKET.

If gasket is broken or distorted, replace with new gasket.

(3) PISTON CAP WASHER.

This washer has 8 small holes drilled in its face. There must be no cracks or breaks between these holes and the inner or outer edge. Replace any washer that is not in perfect condition.

(4) SPRING.

Replace any spring that is broken or distorted. The strength or length of the spring must not be changed.

(5) PISTON AND PISTON STEM PACKINGS.

Packing must be soft and pliable, and its grooved face must have sharp, clean cut edges. Replace any packing not in this condition.

(6) PISTON.

Piston stem must be tight in position. If loose, replace.

(7) THREADS.

All threads on valve body, piston cap, and retainer plug must be in good condition and have free movement on its mating part. Replace any part with burred or damaged threads.

(8) PRIMARY CHECK RETAINER PIN.

Pin must be straight and be $\frac{1}{16}$ inch long.

(9) SAFETY DISK.

Safety disk should not be used the second time. Replace with new disk.

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(10) SAFETY DISK RETAINER.

The face of the retainer which contacts the safety disk must be free from all nicks and scratches, and be smooth. Replace any retainer that is not in this condition.

d. Assembly.

(1) EQUIPMENT.

HAMMER

WRENCH, open-end, $\frac{1}{8}$ -in.

PLIERS

WRENCH, box, $1\frac{1}{2}$ -in.

PLUG, cork, $\frac{5}{8}$ -in.

WRENCH, box, $1\frac{5}{8}$ -in.

PUNCH, pin, $\frac{3}{16}$ -in.

(2) PROCEDURE (fig. 20).

(a) Install Piston Packing.

Gently stretch the packing over the piston. The flat face of the packing must be toward the steel piston stem.

(b) Install Piston In Cap.

Place piston in cap and gently wiggle and press to the bottom of the cap (by hand).

(c) Install Piston Stem Packing.

Insert piston stem packing in recess of valve body at piston cap end. The packing must be inserted grooved face first.

(d) Install Piston Cap.

WRENCH, box, $1\frac{1}{2}$ -in.

Place the hard washer (with the 8 small holes drilled in it) over the piston cap connection. With the piston still in the cap, place the piston stem through the packing and into the body, and securely screw piston cap onto valve body ($1\frac{1}{2}$ -in. box wrench). Run sealing wire through valve body hole and the cap hole, and seal.

(e) Install Primary Check.

PLUG, cork, $\frac{5}{8}$ -in.

Place a cork plug in the valve opening leading to the cylinder. This will prevent the primary check from falling into the cylinder. Place the cylinder horizontally on the work bench with the piston cap pointing down. Place and hold (fingers) the primary check in its recess on the inside of the valve. Then, insert the primary check retaining pin in the small hole, which is drilled in the retaining plug gasket seating surface. Be sure pin also enters the hole on the far side of the check. Remove the

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cork plug. Leave the cylinder in the same position until the retainer plug is installed. This will prevent the primary check pin from falling out.

(f) *Install Secondary Check And Spring.*

PLIERS

Place secondary check (pliers) in place in the valve body. Composition seating surface must go in first. Place spring on secondary check.

(g) *Install Safety Disk.*

HAMMER

WRENCH, box, 1 $\frac{5}{8}$ -in.

Place safety disk in retainer plug opening, and on top of secondary check spring. Lay it on the spring. Do not force it. Place retainer gasket on shoulder of retainer, and tap retainer gently into place, gasket side first. Screw retainer plug into the valve body and tighten securely (1 $\frac{5}{8}$ -in. box wrench).

(h) *Install Recoil Preventer.*

PUNCH, pin, $\frac{3}{16}$ -in.

WRENCH, open-end, 1 $\frac{5}{16}$ -in.

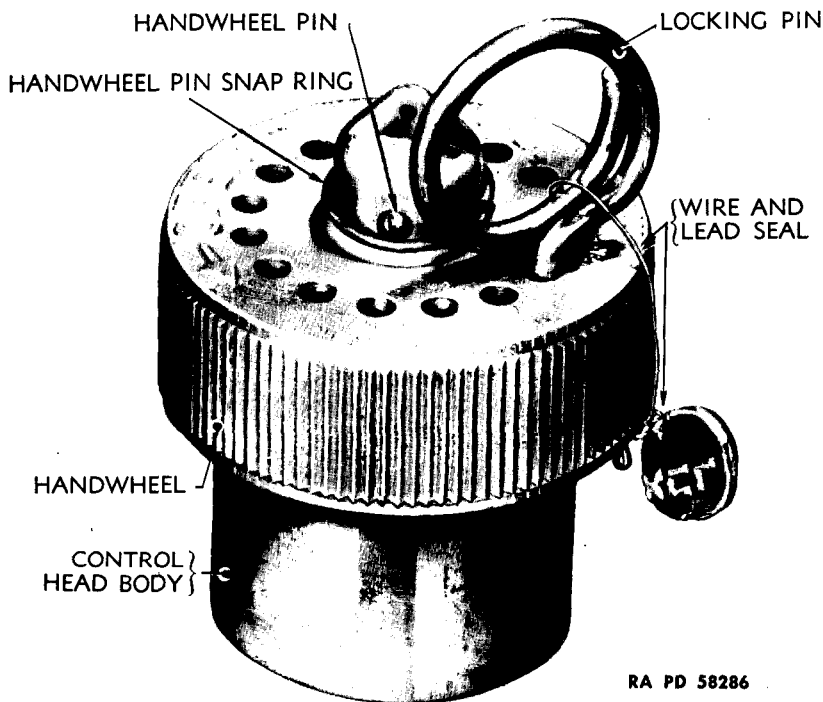
Screw recoil preventer into the valve outlet and tighten ($\frac{3}{16}$ -in. pin punch). Place thread protector over recoil preventer and screw tightly to valve outlet (1 $\frac{5}{16}$ -in. open-end wrench).

(i) *Place Thread Protector On Swivel Nut Connection.*

20. HANDWHEEL, CONTROL HEAD, 7 $\frac{1}{2}$ -POUND UNIT (fig. 21).

a. Description. This control head is mounted above the primary check, on the body of the valve attached to the 7 $\frac{1}{2}$ -pound fire extinguisher, and is a handwheel control job. When the locking pin is pulled, and the handwheel turned three-quarters of a turn counterclockwise, it depresses the primary check of the valve which starts the valve action and causes the cylinder to completely discharge. The body of the control head is made from a 1 $\frac{1}{2}$ -inch hexagonal brass bar. It has an internal right-hand thread for mounting on the valve, and an internal triple left-hand thread for the control head stem to operate in. It is recessed above the triple thread for the operating stem packing, and a final hole pierces the top to allow the operating stem to project through. The operating stem is made of 1-piece brass, having a triple left-hand thread to operate in the body. The upper end is turned to $\frac{5}{16}$ inch to recurve the packing and the handwheel. The handwheel is a white metal die casting, mounted on the operating stem above the valve body, and is secured by a loose fitting pin which in turn is secured by a ring which is snapped over the top of the handwheel.

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**Figure 21 — Kidde-Lux Handwheel Control Head
(7½-Pound Extinguisher)**

b. Removal And Disassembly (fig. 21).

(1) EQUIPMENT.

PENCIL, or a like stick
SCREWDRIVER

WRENCH, open-end, 1½-in.

(2) PROCEDURE.

(a) Removal.

WRENCH, open-end, 1½-in.

Hold cylinder securely (by hand) and unscrew control head (1½-in. open-end wrench) from body of valve.

(b) Disassembly (fig. 22).

PENCIL, or a like stick

SCREWDRIVER

Pull locking pin. Unhook snap ring (screwdriver) over top of handwheel and remove handwheel pin. Lift handwheel off upper end of operating stem. From the mounting end of the body, turn (fingers) operating

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stem clockwise and remove stem from body. Remove packing from its recess (pencil) by gently pushing through the operating stem hole in the top of the control body, and remove packing from the lower end.

c. Inspection.

(1) VALVE BODY.

Inspect internal threads on body of control head. Replace any body with burred or damaged threads.

(2) OPERATING STEM.

Stem must be straight and threaded section have free movement in the body. Replace any bent stem or stem with damaged thread.

(3) PACKING.

Packing must be pliable and its grooved face must have sharp, clean cut edges. Replace any packing not in this condition.

(4) HANDWHEEL.

Handwheel must have fairly snug fit on operating stem. Replace any cracked or broken handwheel.

(5) HANDWHEEL PIN.

Pin must have free fit through handwheel and operating stem, and have snap ring attached. Replace damaged pins.

d. Assembly (fig. 22).

(1) EQUIPMENT.

SCREWDRIVER

(2) PROCEDURE.

(a) *Install Packing.*

Insert packing in its recess in control head body. Flat face goes in first. Push all the way to the bottom of recess.

(b) *Install Operating Stem.*

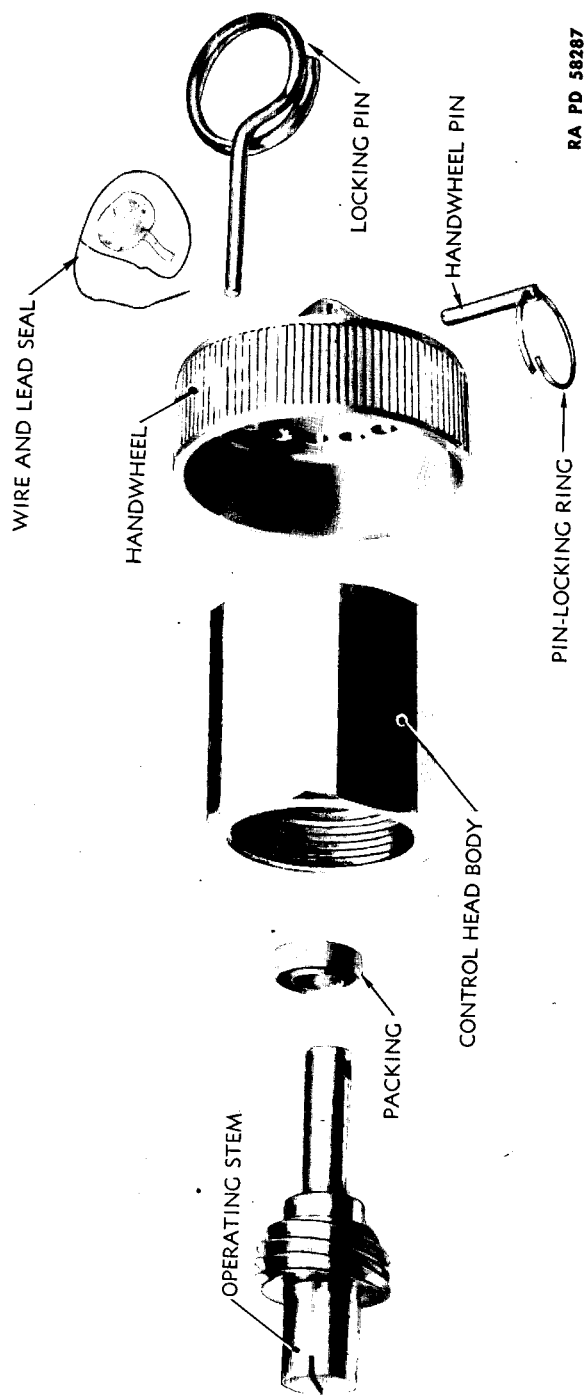
SCREWDRIVER

Insert small end of the operating stem through the bottom end of the body, and screw (screwdriver) counterclockwise until it bottoms.

(c) *Install Handwheel.*

Place handwheel over top of operating stem, and insert pin through handwheel and operating stem. Swing snap ring over the top of the handwheel, and push below the other end of pin. Turn the handwheel clockwise (looking at the handwheel) until the operating stem bottoms. Insert locking pin through handwheel and into control head body. Secure by

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Figure 22 — Kidde-Lux Handwheel Control Head — Disassembled

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passing sealing wire through hole in handwheel adjacent to locking pin, and through the locking pin. Pull the wire tightly over the locking pin and handwheel rim, and secure with a lead seal.

e. Installation.

(1) EQUIPMENT.

WRENCH, open-end, 1½-in.

(2) PROCEDURE.

(a) Make sure handwheel is set and the locking pin sealed.

(b) Screw the control head on the valve of the 7½-pound fire extinguisher above the primary check. Tighten securely (1½-in. open-end wrench).

21. PULL CABLE, CONTROL HEAD, 10-POUND UNIT (fig. 23).

a. **Description.** This control head is mounted above the primary check, on the body of the valve attached to the 10-pound fire extinguisher. It is controlled by either remote control by pulling a cable, or by a small hand lever at the control head. In either case the control head must be reset by hand, at the control head. The unit is composed of a die-cast body with a brass mounting nut (swivel nut), a die-cast sheave and cam assembly with a steel shaft, a plunger assembly, cover and lever. Pulling the cable or moving the lever rotates the cam which pushes the plunger against and opens the primary check of the fire extinguisher valve, thus discharging the entire content of the cylinder.

b. Removal (fig. 23).

(1) EQUIPMENT.

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
⅛-in. bit

WRENCH, open-end, ½-in.

WRENCH, open-end, 1½-in.

(2) PROCEDURE.

(a) *Disconnect Swivel Nut.*

WRENCH, open-end, 1½-in.

Disconnect control head from valve by turning (1½-in. open-end wrench) swivel nut. Lift control head clear of the valve.

(b) *Remove Cover.*

SCREWDRIVER, standard, 6-in.

Remove 3 fillister head machine screws (6-in. standard screwdriver) from the cover, and remove cover. The cable entry fitting is not part of the cover.

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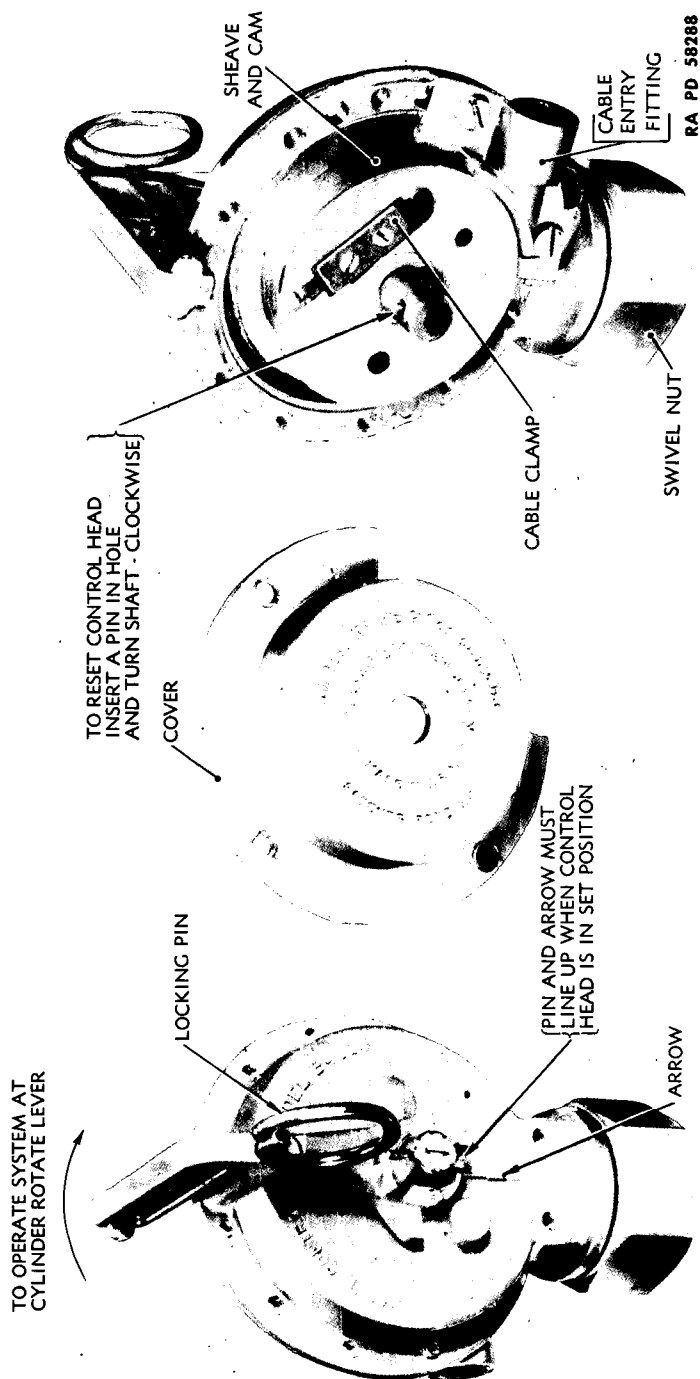


Figure 23 — Setting Of Kidde-Lux Control Head (10-Pound Extinguisher)

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)**(c) Remove Cable.****SCREWDRIVER**, 6-in., with $\frac{1}{8}$ -in. bit

Loosen the 2 setscrews (6-in. screwdriver, with $\frac{1}{8}$ -in. bit) in the cable clamp, and remove cable from clamp.

(d) DISCONNECT TUBING.**WRENCH**, open-end, $\frac{1}{2}$ -in.

Disconnect tubing ($\frac{1}{2}$ -in. open-end wrench) from cable entry fitting, and remove cable from control head.

c. Disassembly (figs. 23 and 24).**(1) EQUIPMENT.****HAMMER****PLIERS****PUNCH**, pin, $\frac{3}{32}$ -in.**PUNCH**, pin, $\frac{1}{4}$ -in.**SCREWDRIVER**, standard,
6-in.**SCREWDRIVER**, stop plunger,
special**SCRIBER****(2) PROCEDURE.****(a) Remove Pull Lever.****PLIERS**

Break sealing wire and pull locking pin from lever. Pull the $\frac{1}{8}$ -inch pin (pliers) from the lever end of the shaft. Slide lever from shaft.

(b) Remove Cam And Sheave Assembly.**SCREWDRIVER**, standard, 6-in.

Remove 5 fillister head machine screws (6-in. standard screwdriver) from the cover and cable entry fitting and remove cover and cable entry fitting. Remove the cam and sheave assembly with shaft (fingers) from body of control head.

(c) Remove Shaft.**HAMMER****PUNCH**, pin, $\frac{3}{32}$ -in.**PUNCH**, pin, $\frac{1}{4}$ -in.

Drive $\frac{1}{8}$ -inch pin (hammer and $\frac{3}{32}$ -in. pin punch) from the sheave and shaft. Drive shaft (hammer and $\frac{1}{4}$ -in. pin punch) from sheave and cam casting.

(d) Remove Stop Plunger.**SCREWDRIVER**, stop plunger, special

Unscrew plunger retainer (special stop plunger screwdriver) from sheave and cam casting. Remove retainer, stop plunger and stop plunger spring.

(e) Remove Operating Plunger And Related Parts.**SCRIBER**

Remove the snap ring (scraper) from the recess at the swivel nut end

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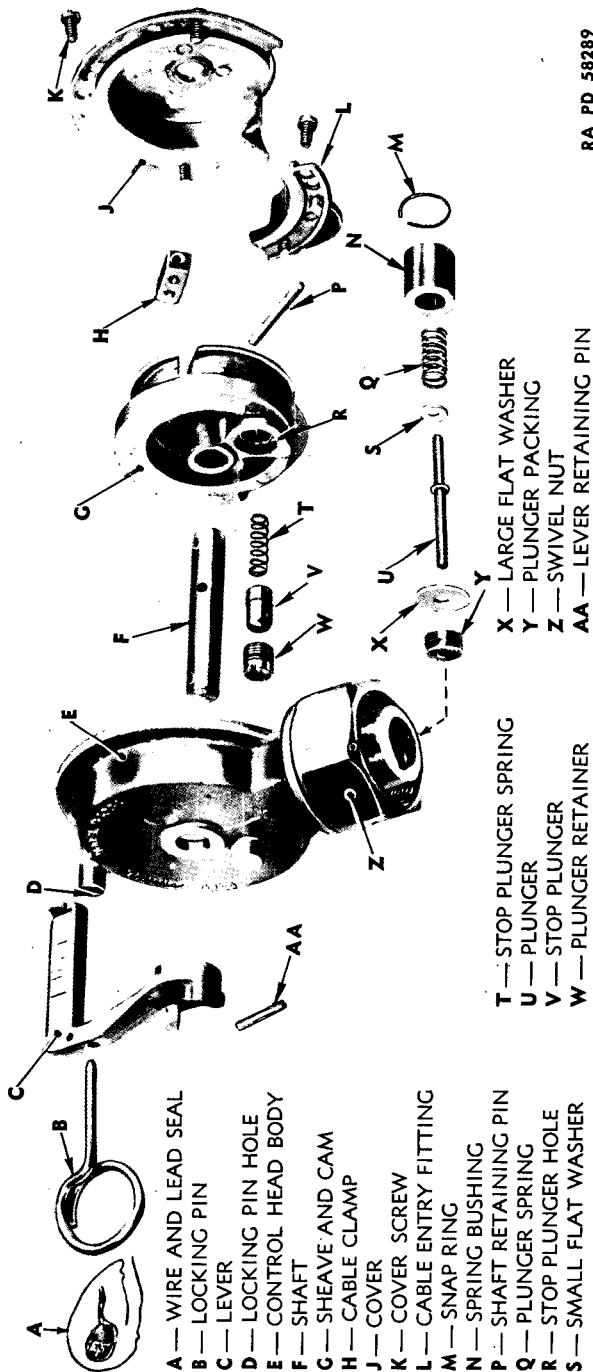


Figure 24 — Kidde-Lux, Control Head — Disassembled (10-Pound Extinguisher).

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of the control head body. Remove from the recess (fingers) the following: plunger spring bushing, plunger spring, a small flat steel washer, the operating plunger, a large flat steel washer, and the operating plunger packing.

d. Inspection (fig. 24).**(1) INSPECT BODY.**

If casting is broken, cracked, the shaft hole worn or the swivel nut thread destroyed, the body must be replaced.

(2) INSPECT OPERATING PLUNGER AND RELATED PART.

Packing must be pliable and the grooved face must have clean, sharp edges. Replace if not in this condition. The operating plunger must be straight. Replace bent plungers. The hole in the flat washers must not be worn. Replace washers with worn holes. The spring must be undistorted and retain its spring tension. Replace springs not in this condition. The plunger spring bushing bore must be large enough to give spring and small washer free movement, and the small hole must allow free movement of the plunger. The snap ring must be a tight fit in its recess. Replace snap rings that have lost their spring tension.

(3) INSPECT CAM STOP PLUNGER.

The stop plunger spring must be unbroken and retain its spring tension. Replace broken or weak springs. The plunger must have free movement in its retainer, and the retainer must have good threads. Replace damaged parts.

(4) CASTINGS.

Replace any cracked or broken casting.

e. Assembly (fig. 24).**(1) EQUIPMENT.**

HAMMER

SCREWDRIVER, standard,

PLIERS

6-in.

PUNCH, pin, $\frac{3}{32}$ -in.

SCREWDRIVER, stop plunger, special

(2) PROCEDURE.**(a) Install Operating Plunger And Related Parts.**

SCREWDRIVER, standard, 6-in.

Place plunger packing in recess in swivel nut connection. Flat side of packing must go in first and must rest in the small recess in the bottom. The grooved face will then be facing outward. Place large flat washer against grooved face of packing. Insert operating plunger through the flat washer and packing. The long section with the rounded end goes in

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first. Place small flat washer on operating plunger, then, the spring and the spring bushing. Press spring bushing in recess and secure by installing the snap ring (6-in. standard screwdriver) in the groove of the recess.

(b) Install Stop Plunger.

SCREWDRIVER, stop plunger, special

Insert spring and stop plunger in sheave casting and secure by screwing (special stop plunger screwdriver) plunger retainer tightly over plunger and into sheave.

(c) Install Shaft.

HAMMER

Press the shaft in the cam and sheave casting with the longer section of the shaft on the stop plunger side. Aline the center hole in the shaft with the $\frac{1}{8}$ -inch hole in the face of the sheave. Drive the $\frac{1}{8}$ -inch pin in the sheave and through the shaft until the end of the pin is flush with the face of the sheave.

(d) Install Cam and Sheave Assembly.

Install cam and sheave assembly in control head body. Long end of shaft, that is on cam side of the assembly, goes through the center hole in body. The stop plunger is positioned over the indentation opposite the stop lug in the body.

(e) Install Cover And Cable Entry Fitting.

SCREWDRIVER, standard, 6-in.

Place cable entry fitting in desired position on body, and secure with 2 fillister head machine screws (6-in. standard screwdriver). Place cable clamp in its slot on the sheave. Place cover over end of shaft and sheave, and secure with 3 fillister head machine screws (6-in. standard screwdriver).

(f) Install Lever.

HAMMER

PLIERS

Place lever over end of the shaft protruding from the back of the body, with the handle of the lever overhanging the control head. Nick the middle of the $\frac{1}{8}$ -inch pin so that it will be tight in the shaft. Insert pin in hole of shaft outside of lever and tap in place (hammer).

(g) Set Control Head.

PUNCH, pin, $\frac{3}{32}$ -in.

Place pin punch in hole of shaft on cover end. Turn shaft clockwise until the pin in shaft on the other side of the head lines up with arrow

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

cast in the body. In this position, the stop plunger on the cam drops into the indentation on the inside of the body. Watch the operating plunger at the swivel nut; it must move about $\frac{3}{8}$ inch when the lever is moved as far as it will go toward the swivel nut. Reset shaft, insert locking pin through lever and into body of control head. Secure by passing sealing wire through the hole in the lever and tighten around the locking pin and seal with lead seal.

f. Installation.**(1) EQUIPMENT.**

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
 $\frac{1}{8}$ -in. bit
WRENCH, open-end, 1½-in.

(2) PROCEDURE.**(a) Remove Cover And Cable Entry Fitting.**

SCREWDRIVER, standard, 6-in.

Remove 5 machine screws from cover and cable entry fitting, and remove:

(b) Connect Cable Tubing.

Pass pull cable through cable entry fitting, and loosely fasten cable tubing to cable entry fitting.

(c) Install Cable To Sheave.

SCREWDRIVER, standard,
6-in.

SCREWDRIVER, 6-in., with
 $\frac{1}{8}$ -in. bit

Pass 2 turns of the cable around the sheave. Install cable entry fitting in desired position on control head body, and secure with 2 machine screws (6-in. standard screwdriver). Place the cable end through the cable clamp so that the clamp will just drop into the recess on the sheave. Tighten setscrews (6-in. screwdriver with $\frac{1}{8}$ -in. bit) of the cable clamp tightly on cable.

(d) Install Control Head Cover.

SCREWDRIVER, standard, 6-in.

Install cover over cable sheave and secure with 3 machine screws (6-in. standard screwdriver).

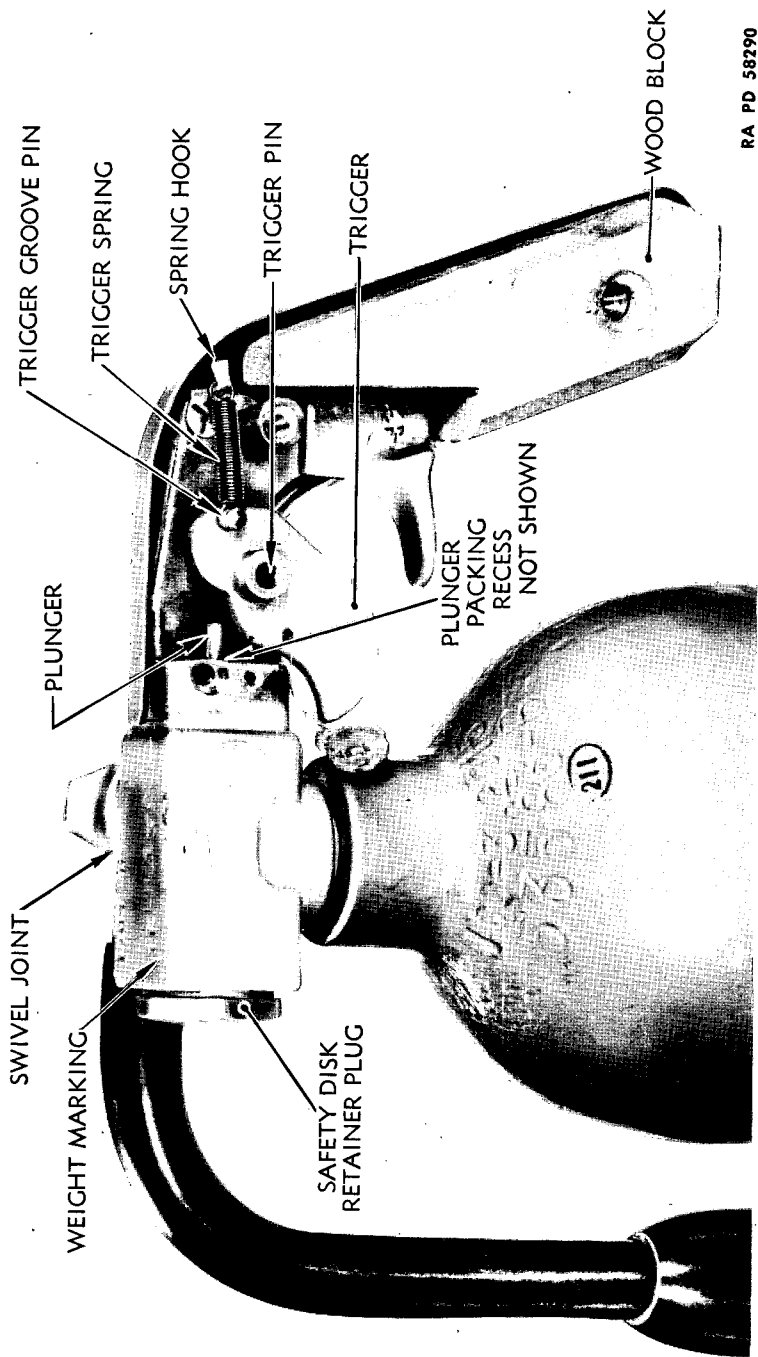
(e) Install Control Head To Valve.

WRENCH, open-end, ½-in.

WRENCH, open-end, 1½-in.

Place control head on valve of cylinder, and screw swivel nut (1½-in. open-end wrench) on valve body securely. Tighten cable tube connection (½-in. open-end wrench) tightly to cable entry fitting.

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Figure 25 — Kidde-Lux Trigger Grip Valve With Handle Cover Removed

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)**22. KIDDE-LUX TRIGGER GRIP VALVE, 4-POUND UNIT.**

a. Description (fig. 25). The Kidde-Lux trigger grip valve is the equipment placed on the 4-pound portable fire extinguisher for controlling the discharge of carbon dioxide from the cylinder. It is composed of a main body of bronze which contains a valve check backed up with a spring, a check stem, and a cam with trigger which when pulled opens the valve check. A swivel joint is attached to the discharge stud to which is attached the discharge tube and horn. The valve check spring is backed up with a safety disk which is secured to the valve body by a screw plug retainer. This disk is calibrated to rupture at 2600 pounds. When this disk ruptures, the entire content of the cylinder bypasses the valve check and is discharged through the discharge horn. A handle of stamped sheet brass is attached to the valve to provide a means of carrying the extinguisher to the scene of the fire.

b. Disassembly. NOTE: Be sure cylinder is completely empty before starting any disassembly.

(1) EQUIPMENT.**HAMMER****SCREWDRIVER**, cross recess
head**PLIERS****PUNCH**, pin**WRENCH**, box, 1-in.**ROD**, brass, 1/8 x 6-in.**WRENCH**, open-end, 3/8-in.**(2) PROCEDURE** (figs. 25 and 26).**(a) Remove Safety Disk And Valve Check.****WRENCH**, box, 1-in.

Unscrew and remove (1-in. box wrench) the safety disk retainer plug and the composition plug gasket from the valve body. With your hand over the plug opening, turn valve with plug opening downward and shake the following parts from the plug opening: safety disk, safety disk guard, valve check spring, and the valve check.

(b) Remove Discharge Horn.

Unscrew by hand the discharge horn from the discharge tubes.

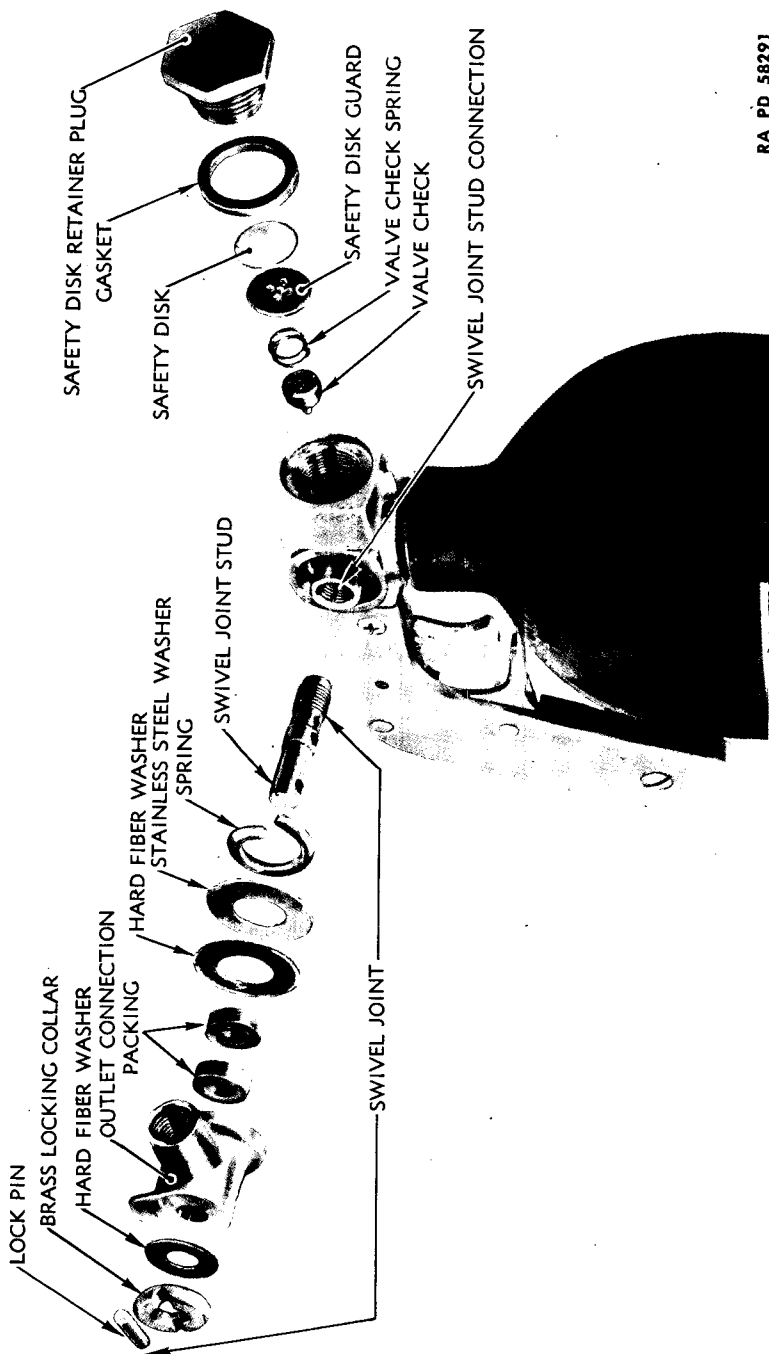
(c) Remove Discharge Tube.

Unscrew by hand the discharge tube from the swivel joint.

(d) Remove Swivel Joint.**HAMMER****PUNCH**, pin**PLIERS****WRENCH**, open-end, 3/8-in.

Tap lock pin (hammer and pin punch) partly from its hole in end of the stud; then pull (pliers) it all the way out. Remove from the stud in

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FIRE EXTINGUISHERS



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Figure 26 — Kidde-Lux Trigger Grip Valve — Disassembled

KIDDE-LUX FIRE EXTINGUISHERS (CO₂)

the following order: brass locking collar, hard fibre washer, the outlet connection, another hard fibre washer, a stainless steel washer, a heavy 1-turn spring, and 1 piece of packing. Remove 1 piece of packing from the outlet connection. Place locking pin in hole of stud and unscrew ($\frac{3}{8}$ -in. open-end wrench) stud from valve body.

(e) Plunger Packing And Trigger.

ROD, brass, $\frac{1}{8}$ x 6-in.

SCREWDRIVER, cross recess head

Remove 4 screws (cross recess head screwdriver) from the handle of the extinguisher and remove one side of the handle and a block of wood. Unhook trigger spring from the spring hook and slide trigger off the trigger pin. Remove plunger pin with packing and packing washer from the valve body. It may be necessary to push these parts out of the valve by using a $\frac{1}{8}$ x 6-in. brass rod, inserted from the safety disk opening.

c. Inspection (fig. 26).**(1) VALVE CHECK.**

Inspect composition seat of check for cuts, cracks, worn, or broken surface. Replace all checks not in perfect condition.

(2) SAFETY DISK AND GASKET.

Safety disk and gasket should never be used the second time. Once removed from valve they should be discarded.

(3) SPRINGS.

Replace any spring that is broken or that has lost its spring tension.

(4) FIBRE AND METAL WASHERS.

Replace all washers that are broken, bent, or badly scratched.

(5) RETAINER PLUG.

The disk face of retainer plug must be smooth and free of nicks. Nicks on this surface may damage safety disk. Replace damaged plugs.

(6) CAM AND TRIGGER.

Inspect cam and trigger for free movement on pin.

(7) STRAINER.

Clean and inspect all strainers. If damaged at all, replace.

(8) THREADS.

Inspect threads on retainer, studs, screws; discharge tube and horn. Rethread or replace damaged unit.

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(9) **DISCHARGE TUBE AND RECOIL ADAPTER.** Check (with compressed air) for free passage through tube and adapter. Replace any unit that cannot be blown out.

(10) **HORN AND NOZZLE.**

Check nozzle for free passage of air. Replace cracked or broken horns.

(11) **PACKING.**

Replace packing. New packing should be used when assembling.

d. Assembly.

(1) **EQUIPMENT.**

NAIL, small

WRENCH, box, 1-in.

PLIERS

WRENCH, open-end, $\frac{3}{8}$ -in.

SCREWDRIVER, cross recess
head

(2) **PROCEDURE (fig. 26).**

(a) *Install Valve Check And Safety Disk.*

WRENCH, box, 1-in.

Place valve in position so that the safety plug hole is uppermost, and make sure there is no dirt on the seat in the valve body. Insert valve check through safety disk opening and into recess. Steel pin of valve check goes in first. Insert valve check spring in recess on top of the valve check. Insert celoron safety disk guard over the spring. Place a new safety disk (only one) on top of the safety disk guard. Place new composition retainer seal on retainer plug, and screw retainer plug into valve body. Tighten securely (1-in. box wrench).

(b) *Install Plunger Packing.*

NAIL, small

When installing plunger packing, care must be taken not to cut packing on edges of screw holes. Place packing in recess of valve at handle end, with grooved face of packing in first. Push packing with 1 finger until inner edge becomes visible through the 2 screw holes. Continue to hold a slight pressure on the packing, and with a small nail, press packing lightly, first through 1 screw hole and then the other, until packing is completely past the 2 screw holes. Check position of packing to make sure it did not turn over.

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(c) *Install Plunger And Related Part.*

NAIL, small

SCREWDRIVER, cross recess
head

Insert plunger through plunger packing and against valve check. Place plunger packing washer over the plunger and press (small nail) washer and packing to the bottom of the recess. The outer edge of the washer must be past the 2 screw holes. When screws are installed they will act as a stop for this washer. Place trigger on trigger pin. Hook trigger spring on trigger groove pin and spring hook. Place the wooden block in position in handle. Pull trigger back and place handle half in place, and secure by tightly installing the 4 Phillips head screws (No. 2 Phillips screwdriver).

(d) *Install Swivel Joint.*

PLIERS

WRENCH, open-end, $\frac{3}{8}$ -in.

Screw swivel joint stud into the discharge outlet hole on valve body. Place the lockpin in top hole and tighten securely ($\frac{3}{8}$ -in. open-end wrench). Remove lockpin from stud. Place the heavy one-turn-spring over the stud and into the recess of the valve body. Place the stainless steel washer, then the large hard fibre washer, over the spring. Gently work 1 new piece of packing over the stud, having flat face of packing against the shoulder of the valve body. Insert 1 new piece of packing in recess of swivel joint outlet connection. Flat face goes in first and all the way to the bottom of the recess. Place outlet connection over the stud, open side first. Place the small hard fibre washer, then the brass locking collar over stud. Push entire swivel joint assembly toward the valve body compressing the spring, then insert lockpin (pliers).

(e) *Install Discharge Horn.*

Screw discharge tube securely into outlet connection of swivel joint by hand. Screw discharge horn securely onto lower end of discharge tube. Swing horn to side of cylinder. It may be necessary to change setting of discharge tube in outlet connection of swivel joint, to line up horn to cylinder.

23. CYLINDERS AND SIPHON TUBE.

a. **Cylinders.** These cylinders are made of high quality steel, 1 piece construction, and the top end is drawn into a neck. The neck is bored and threaded to receive the cylinder control valve. Cylinders, used as holders of carbon dioxide are hydrostatically tested to withstand a pressure of 3,360 pounds. This test must be made every five years and date of last test stamped on the cylinder, just below the neck. Any cylinder that is

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badly dented, cracked, or damaged by gunfire must be discarded. Damaged cylinders must never be welded.

b. Siphon Tube.

(1) **DESCRIPTION.** The siphon tube is of copper, threaded on 1 end and cut at an angle at the other end. It is long enough to extend from the valve body, where it is securely fastened by the threaded end, to $\frac{3}{8}$ -inch from the bottom of the cylinder. Its purpose is to allow the complete discharge of the liquid carbon dioxide from the cylinder.

(2) **INSPECTION.** Shake cylinder, if a rattling noise is heard, the siphon tube is broken. Replace siphon tube.

(3) **REMOVE SIPHON TUBE. NOTE:** Do not remove siphon tube or valve, unless inspection finds it necessary.

WRENCH, open-end, 2-in.

WRENCH, pipe, 6-in.

Clamp fire extinguisher securely to the work bench (do not use a vise). Unscrew extinguisher valve (2-in. open-end wrench) from cylinder, and remove valve and siphon tube. If any part of the tube remains in the cylinder, turn it upside down and remove all parts. Remove siphon (6-in. pipe wrench) from valve.

(4) INSTALL SIPHON TUBE.

LEAD, white, or other thread
sealing compound

WRENCH, open-end, 2-in.
WRENCH, pipe, 6-in.

Screw threaded end of new siphon tube into valve body. Apply white lead to threaded section of valve body, and screw it into the neck of the cylinder. Tighten (2-in. open-end wrench) securely.

Section IV

FIRE GUARD FIRE EXTINGUISHER (CCl₄)

	Paragraph
Description	24
Operation	25
Fluid and its effect on personnel	26
Maintenance	27
Filling	28
Disassembly	29

24. DESCRIPTION.

Ordinance No.	Type	Size	Manufacturer's Identification
A229521	Portable	1-qt	Model 85-HD

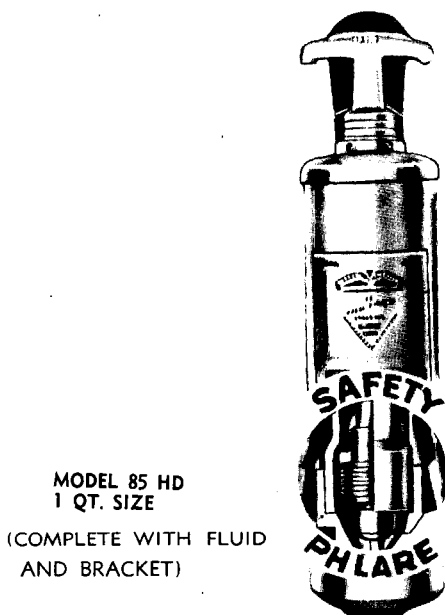
a. **General.** The Fire Guard fire extinguisher is a small hand pumping type fire extinguisher of the 1-quart size, manufactured by the General Detroit Corporation. It has monel metal bearings throughout, drop-forged Nilite bronze handle and cap and drawn brass shell. It is of the vaporizing liquid-type extinguisher using basically CARBON TETRACHLORIDE (CCl₄) as an agent for fighting fire. The CARBON TETRACHLORIDE used is treated with other chemicals to make it harmless to the internal mechanism, and also to lubricate the moving parts. Commercial carbon tetrachloride should not be used in this extinguisher.

b. **Safety "Phlare."** The pump cylinder of this extinguisher is built with a Safety "Phlare" in the lower end. On the inside of this cylinder is placed a small rod called a pump piston. Covering the pistons are the piston felts. These piston felts and pistons are assembled in a cylinder. In the Fire Guard extinguisher, the bottom of the cylinder is expanded or enlarged so that the piston felts are not tightly compressed against the sides of the cylinder when the pump piston is in its natural locked position. The pump operating efficiency is therefore increased, as the piston felts are always in their naturally expanded position when the extinguisher is not in use.

c. **Pump.** The pump in this extinguisher is double acting; that is, it expels the fluid on both the upstroke and the downstroke. In this way, it assures a constant stream of fire fighting liquid pouring on the fire. All vital parts are noncorrosive monel metal construction and will last indefinitely.

d. **Nozzle.** The discharge nozzle is tapered to the opening, like a fire hose nozzle, which results in an improved stream. It is placed in the

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RA PD 58372

Figure 27 — Fire Guard Fire Extinguisher

extinguisher in such a manner as to be amply protected in the event of dropping. This construction also tends to keep the nozzle opening clear.

e. **Handle And Cap.** Both of these important parts are made of drop-forged Nilite bronze and are of the locking type.

f. **Shell.** The shell is cylindrical in shape, made of strong brass with no corrugations. It has a polished and lacquered finish.

g. **Bracket.** The bracket supplied for this extinguisher is of the positive action type. It is held positively in place by an antirattle spring, but is readily removed by pushing the plate indicated.

25. OPERATION.

a. Hold the body of the extinguisher in one hand and the handle in the other hand. Turn the handle one-quarter turn and pull all the way out and then push it all the way in. This will force the fluid from the extinguisher. The faster this action is performed the further the stream coming from the extinguisher will go. Continue the pumping action, directing stream of fluid at base of flame, until the fire is out. When the Fire Guard fluid is pumped onto a fire, the heat generates a vapor heavier than air

FIRE GUARD FIRE EXTINGUISHER (CCl₄)

which blankets and smothers the fire by excluding oxygen from it. Refill extinguisher with proper fluid immediately after using. Push handle in locking recess and give a one-quarter turn to lock.

26. FLUID AND ITS EFFECT ON PERSONNEL.

a. Fire Guard fluid is manufactured under a freezing process which results in the fluid being free of moisture. The slightest degree of moisture in the fluid causes hydrochloric fumes which are very corrosive.

b. The fluid is manufactured under a process that makes it a non-conductor of electricity. This feature is a protection for the operator of the extinguisher, when it is being used on electrical fires, such as on dynamos, motors, or switchboards.

c. The fluid will not freeze at a temperature as low as 50 degrees below zero.

d. The fluid is free of the corrosive elements usually found in commercial grades of carbon tetrachloride.

e. The fluid contains sufficient lubricant ingredients to protect the mechanical parts of the extinguisher.

f. CARBON TETRACHLORIDE, which is the basic ingredient of this fluid, vaporizes. Personnel exposed to these fumes in a confined place are liable to get a headache, and continued contact with it over a longer period, is likely to produce low blood pressure.

27. MAINTENANCE.

a. Extinguisher must be examined, to make sure that it has not been tampered with or removed from its designated place, to detect any injury, to see that handle is in the locked position, to see that it is full, and that the orifice of the nozzle is not clogged.

b. Every 4 months a part of the contents of the extinguisher must be discharged into a glass container. If the fluid is *clean*, it must be poured back and the extinguisher filled through the filler hole in the cap. If it is excessively dirty, new fluid must be placed in the extinguisher. By the above performance, a check is made on the amount and condition of the fluid in the extinguisher. It also determines if the pump on the extinguisher is operating satisfactorily.

c. Under no circumstances must water be put into the extinguisher. The slightest amount of moisture in the fluid causes hydrochloric fumes which is highly corrosive and causes damage to the internal parts of the extinguisher.

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FIRE EXTINGUISHERS

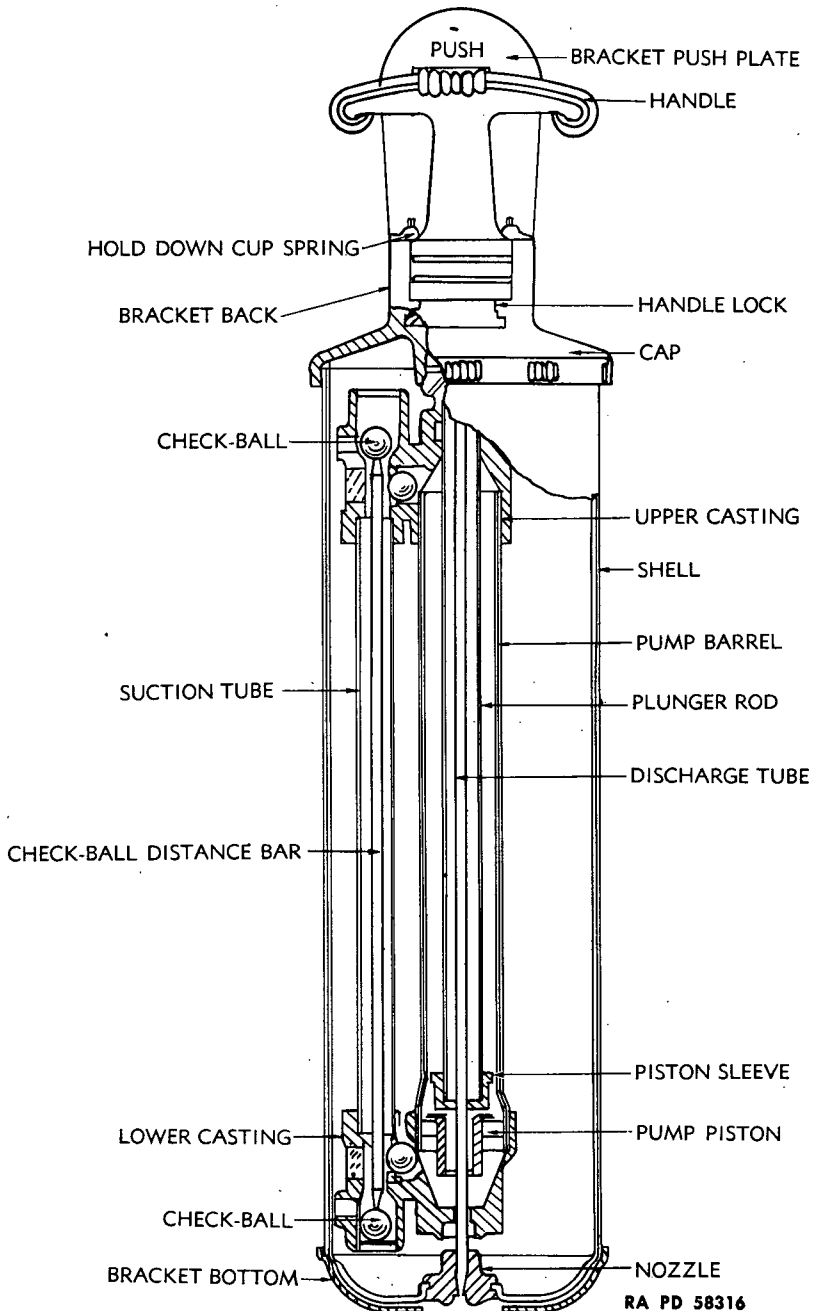


Figure 28 — Fire Guard Fire Extinguisher — Sectionalized

FIRE GUARD FIRE EXTINGUISHER (CCI₄)

28. FILLING.

- a. Remove gasket and plug on top of extinguisher.
- b. Place a funnel in the hole and fill extinguisher with Fire Guard fire extinguisher fluid or Federal Specification OF-380.
- c. Install gasket and plug securely in top of extinguisher.

29. DISASSEMBLY.

- a. Due to the method used in assembling the top and bottom units on the cylinder, this extinguisher is not to be disassembled. Replace complete extinguisher.

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Section V

O-FIRE-GUN FIRE EXTINGUISHER (CCI₄)

	Paragraph
Description	30
Operation	31
Fluid and its effect on personnel	32
Maintenance	33
Filling	34
Disassembly	35
Inspection and repair	36
Assembly	37

30. DESCRIPTION.

a. The O-Fire-Gun fire extinguisher is a small hand pumping type fire extinguisher of the 1-quart size, manufactured by American-La France-Foamite Corporation and is as follows:

Ordinance No.	Style	Size	Manufacturer's No.
C74060	Portable	1-qt	13X-1193

b. This extinguisher is cylindrical in shape, of brass construction. It has a system of ball checks to control the flow of fluid.

c. The handle is equipped with a locking device. The inside lower end of the cylinder has a shutoff valve. This valve is closed when the handle is in the locked position.

d. The suction tubes are weighted and mounted in ball joints. This construction allows the suction tube to fall to the lowest point of the fluid section of the extinguisher, regardless of position in which the extinguisher is operated, permitting the complete discharge of the fluid.

e. The discharge nozzle and shutoff valve are replaceable without disassembly of the cylinder.

f. This extinguisher is of the vaporizing liquid type and the fluid used is basically carbon tetrachloride. The fluid is treated to furnish lubrication to the moving parts and to offset corrosion.

31. OPERATION.

a. The operation of this extinguisher is the same as that which is explained in paragraph 25.

O-FIRE-GUN FIRE EXTINGUISHER (CCI₁)**32. FLUID AND ITS EFFECT ON PERSONNEL.**

- a. Refer to paragraph 26.

33. MAINTENANCE.

- a. Refer to paragraph 27.

34. FILLING.

- a. Remove filling plug and gasket from the top of the extinguisher.
- b. Place a funnel in the filling hole and fill the extinguisher with fluid as furnished by the extinguisher manufacturer or with Federal Specification OF-380.
- c. Install gasket and plug securely.

35. DISASSEMBLY.

- a. Equipment.

PLIERS

WRENCH, nozzle, No. 13X233

WRENCH, box

- b. Procedure (fig. 29).

(1) Remove filler plug and gasket from the top of the fire extinguisher.

(2) Remove handle. Turn handle one-quarter turn to unlock, and pull handle 1 or 2 inches. Hold piston rod with pliers (protect rod from nicks with a piece of sheet brass), and unscrew handle from top of rod, by turning counterclockwise. Remove hand seal lower gasket and handle seal upper gasket from recess in handle.

(3) Remove discharge nozzle. With nozzle service wrench, unscrew discharge nozzle (right-hand thread), and remove gasket.

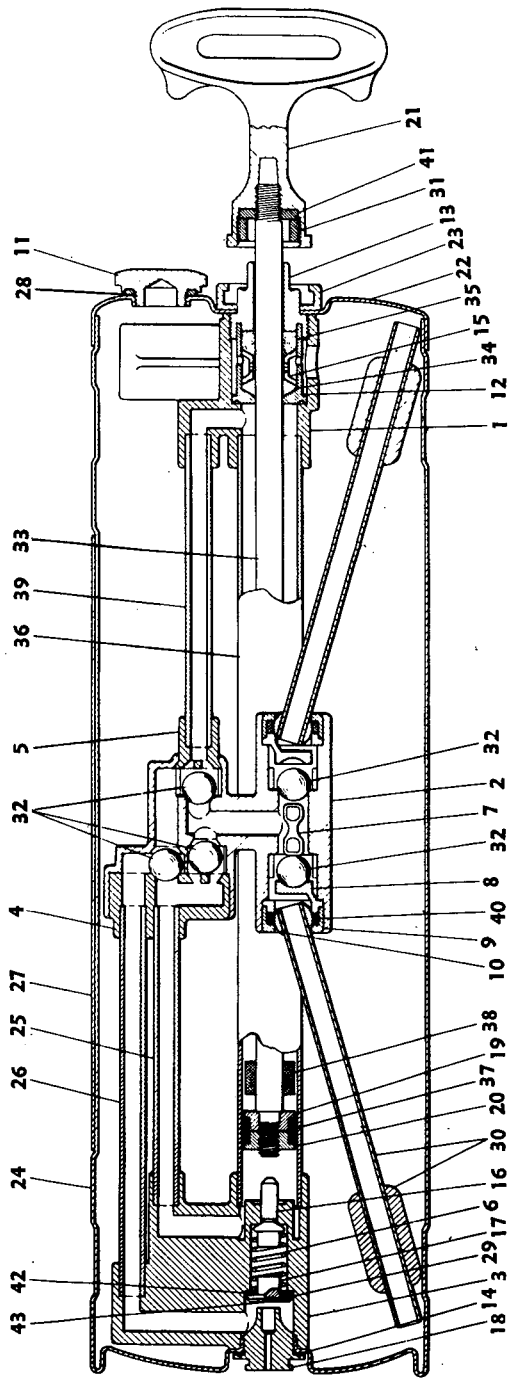
(4) After the discharge nozzle has been removed, the following parts will drop out: shutoff disk assembly, shutoff valve facer and shutoff valve disk, shutoff valve gasket, shutoff valve spring, and nozzle plunger.

(5) Do not disassemble the extinguisher further than the above steps.

36. INSPECTION AND REPAIR.

- a. Inspect the handle. If bent or broken, repair or replace.
- b. Inspect the handle gaskets. If damaged or out of shape, replace.

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RA PD 58317

Figure 29 — O-Fire-Gun Fire Extinguisher

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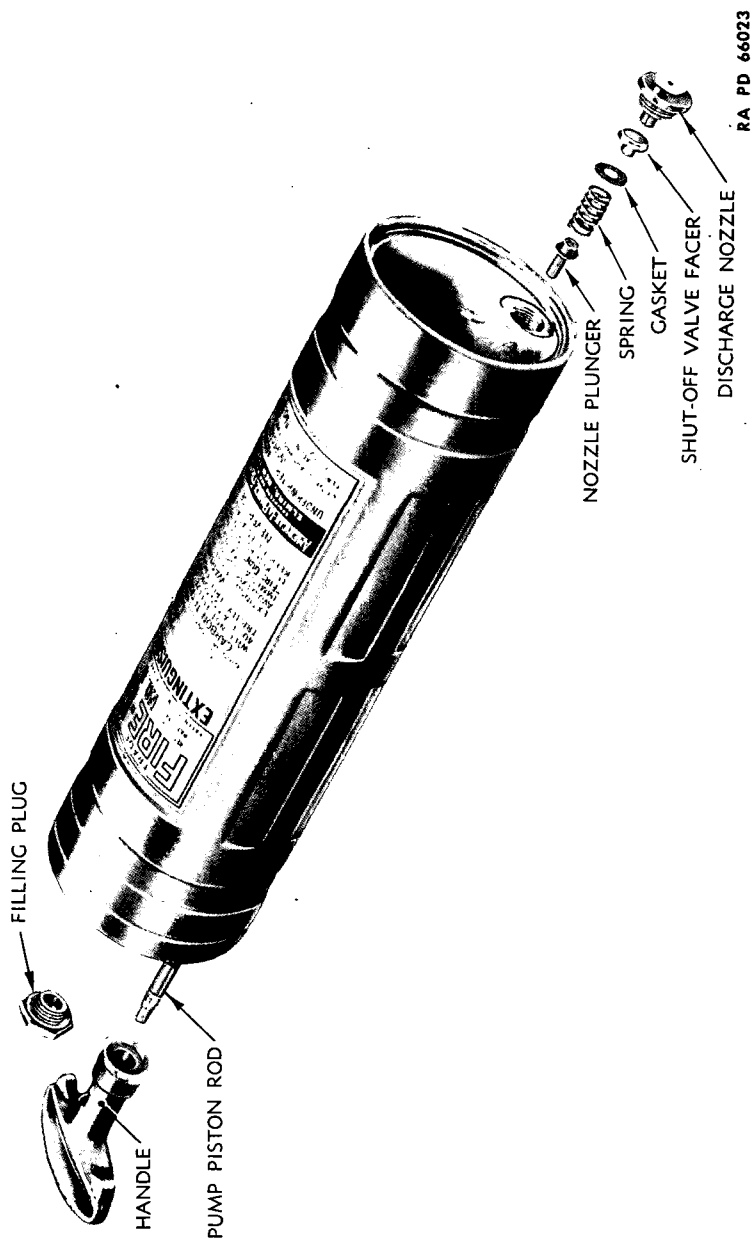


Figure 30 — O-Fire-Gun Fire Extinguisher — Disassembled

O-FIRE-GUN FIRE EXTINGUISHER (CCI,)



RA PD 66024

Figure 31 — O-Fire-Gun Fire Extinguisher

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FIRE EXTINGUISHERS**

- e. Inspect the discharge nozzle for good, clean, clear opening. Replace any nozzle not having a perfect orifice.
- d. Inspect the discharge nozzle gasket. Replace if not in perfect condition.
- e. Inspect the shutoff disk assembly. If the seat is scratched, nicked, or marked from the nozzle, it should be replaced.
- f. Inspect the shutoff gasket. If not in perfect condition, replace.
- g. Inspect the shutoff valve spring. If broken or out of shape it must be replaced.
- h. Inspect the nozzle plunger. Plunger must be free of nicks, not bent, and have free movement in its operating position. Replace any plunger not meeting these conditions.
- i. Inspect the extinguisher shell for breaks, cracks, or badly dented condition. Do not repair. Replace with a new extinguisher.

37. ASSEMBLY.

a. Equipment.

PLIERS

WRENCH, nozzle, No. 13-233

WRENCH, box

b. Procedure.

- (1) Turn extinguisher bottom side up. Install through the discharge nozzle opening in the following order: nozzle plunger, shutoff valve spring, shutoff disk gasket, shutoff valve disk assembly, discharge nozzle gasket, and secure by tightly screwing the nozzle in the bottom.
- (2) Install top and bottom gaskets in handle.
- (3) Hold piston rod firmly with pliers (protect rod from nick with a piece of sheet brass) and screw handle securely on rod.
- (4) Push handle in locking recess and give one-quarter turn to lock.
- (5) Fill extinguisher with fluid and install gasket and filling plug securely.

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[A.G. 062.11 (4-8-43)
O.O. 461/10473 O.O. (4-23-43)]

BY ORDER OF THE SECRETARY OF WAR:

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The Adjutant General.

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(For explanation of symbols, see FM 21-6)